PROCEEDINGS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

AT THE

FORTY-FIFTH ANNUAL MEETING,

HELD AT

LAKE MINNETONKA, MINN., AUGUST, 1897.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

BALTIMORE:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1897.

4277

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1897-98.

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Colorado.	John Kochan, Denver.
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Illinois.	C. S. N. Hallberg, Chicago.
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(Appointed by the President.)

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Alabama.	P. C. Candidus, Mobile.
Arizona.	Clemens L. Eschmann, Phoenix.
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Florida.	Geo. W. Fisher, De Land.
Georgia.	Geo. F. Payne, Atlanta.
Idaho.	David E. Smithson, Emmett.
Illinois.	H. H. Rogers, Kankakee.
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LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852..	Philadelphia, Pa....	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	*Samuel M. Colcord*, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853..	Boston, Mass.......	*William A. Brewer*, Boston.	*George D. Coggeshall*, New York.	*Alexander Duval*, Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.......	*William B. Chapman*, Cincinnati.	Henry T. Cummings, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855..	New York, N. Y....	*John Meakim*, New York.	Charles B. Guthrie, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md......	*George W. Andrews*, Baltimore.	*John L. Kidwell*, Washington, D. C.	Frederick Stearns, Detroit, Mich.	*Henry T. Kiersted*, New York, N. Y.
Sept. 8, 1857..	Philadelphia, Pa. ...	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C...	*John L. Kidwell*, Georgetown, D. C.	Edward R. Squibb, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.......	*Samuel M. Colcord*, Boston.	*William Procter, Jr.*, Philadelphia.	*Joseph Roberts*, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860..	New York, N. Y. ...	*Henry T. Kiersted*, New York.	William J. M. Gordon, Cincinnati.	*William S. Thompson*, Baltimore.	*Theodore Metcalf*, Boston.
Aug. 27, 1862..	Philadelphia, Pa. ...	*William Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L. Massot*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863..	Baltimore, Md......	*J. Faris Moore*, Baltimore.	*John M. Maisch*, Philadelphia.	Chas. A. Tufts, Dover, N. H.	*George W. Weyman*, Pittsburgh.
Sept. 21, 1864..	Cincinnati, O.......	William J. M Gordon, Cincinnati.	*Richard H. Stabler*, Alexandria, Va.	Enno Sander, St. Louis.	*Thomas Hollis*, Boston.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865..	Boston, Mass.	*Henry W. Lincoln*, Boston.	*George C. Close*, Brooklyn, N. Y.	*Elijah W. Sackrider*, Cleveland, O.	Charles A. Heinitsh, Lancaster, Pa.
Aug. 22, 1866..	Detroit, Mich.	Frederick Stearns, Detroit, Mich.	*Edward Parrish*, Philadelphia.	Ezekiel H. Sargent, Chicago.	*John W. Shedden*, New York.
Sept. 10, 1867..	New York, N. Y.	*John Milhau*, New York.	Robert J. Brown, Leavenworth, Kan.	*N. Hynson Jennings*, Baltimore.	*Daniel Henchman*, Boston.
Sept. 8, 1868..	Philadelphia, Pa.	*Edward Parrish*, Philadelphia.	*Ferris Bringhurst*, Wilmington, Del.	*Edward S. Wayne*, Cincinnati.	Albert E. Ebert, Chicago.
Sept. 7, 1869..	Chicago, Ill.	Ezekiel H. Sargent, Chicago.	Ferdinand W. Sennewald, St. Louis.	*John H. Pope*, New Orleans.	Joel S. Orne, Cambridgeport, Mass.
Sept. 13, 1870..	Baltimore, Md.	*Richard H. Stabler*. Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	*Eugene L. Massot*, St. Louis.
Sept. 12, 1871..	St. Louis, Mo	Enno Sander, St. Louis.	C. Lewis Diehl, Louisville, Ky.	*George F. H. Markoe*, Boston.	*Matthew F. Ash*, Jackson, Miss.
Sept. 3, 1872..	Cleveland, O.	Albert E. Ebert, Chicago.	*Samuel S. Garrigues*, East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	*Henry C. Gaylord*, Cleveland, O.
Sept. 16, 1873..	Richmond, Va.	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	*Paul Balluff*, New York.
Sept. 8, 1874..	Louisville, Ky.	C. Lewis Diehl, Louisville, Ky.	*Joseph Roberts*, Baltimore.	William T. Wenzell, San Francisco.	Augustus R. Bayley, Cambridgeport, Mass.
Sept. 7, 1875..	Boston, Mass.	*George F. H. Markoe*, Boston.	Frederick Hoffmann, New York.	T. Roberts Baker, Richmond, Va.	Christian F. G. Meyer, St. Louis.
Sept. 12, 1876..	Philadelphia, Pa.	Charles Bullock, Philadelphia.	Samuel A. D. Sheppard, Boston.	*Gustavus J. Luhn*, Charleston, S. C.	*Jacob D. Wells*, Cincinnati.
Sept. 4, 1877..	Toronto, Can.	William Saunders, London, Ont.	Ewen McIntyre, New York.	John Ingalls, Macon, Ga.	*Emlen Painter*, San Francisco.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878..	Atlanta, Ga.........	*Gustavus J. Luhn*, Charleston, S. C.	*Frederick T. Whiting*, Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879..	Indianapolis, Ind. ..	George W. Sloan, Indianapolis, Ind.	T. Roberts Baker, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880..	Saratoga, N. Y.	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	William S. Thompson, Washington, D. C.	William Simpson, Raleigh, N. C.
Aug. 23, 1881..	Kansas City, Mo....	*P. Wendover Bedford*, New York.	*Emlen Painter*, San Francisco.	George Leis, Lawrence, Kan.	*John F. Judge*, Cincinnati.
Sept. 12, 1882..	Niagara Falls, N. Y..	Charles A. Heinitsh, Lancaster, Pa.	John Ingalls, Macon, Ga.	Louis Dohme, Baltimore.	*William B. Blanding*, Providence, R. I.
Sept. 11, 1883..	Washington, D. C...	William S. Thompson, Washington, D. C.	Charles Rice, New York.	*Frederick H. Masi*, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884..	Milwaukee, Wis	John Ingalls, Macon, Ga.	*John A. Dadd*, Milwaukee, Wis.	Henry Canning, Boston, Mass.	*Charles F. Goodman*, Omaha, Neb.
Sept. 8, 1885..	Pittsburgh, Pa......	*Joseph Roberts*, Baltimore, Md.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886..	Providence, R. I....	Chas. A. Tufts, Dover, N. H.	*Henry J. Menninger*, Brooklyn, N. Y.	M. W. Alexander, St. Louis, Mo.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887..	Cincinnati, O.......	John U. Lloyd, Cincinnati, O.	M. W. Alexander, St. Louis, Mo.	A. K. Finlay, New Orleans, La.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888..	Detroit, Mich	M. W. Alexander, St. Louis, Mo.	Jas. Vernor, Detroit, Mich.	*Fred. Wilcox*, Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889..	San Francisco, Cal..	*Emlen Painter*, New York.	Karl Simmon, St. Paul, Minn.	Wm. M. Searby, San Francisco.	Jos. W. Eckford, Aberdeen, Miss.
Sept. 8, 1890..	Old Pt. Comfort, Va.	A. B. Taylor, Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	Chas. E. Dohme, Baltimore, Md.	Jas. M. Good, St. Louis, Mo.

ROLL OF OFFICERS (Concluded).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
April 27, 1891..	New Orleans, La....	A. K. Finlay, New Orleans, La.	Geo. J. Seabury, New York, N. Y.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892..	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	Sidney P. Watson, Atlanta, Ga.	Wm. H. Averill, Frankfort, Ky.
Aug. 14, 1893..	Chicago, Ill........	Edgar L. Patch, Boston.	Leo Eliel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore, Md.
Sept. 3, 1894..	Asheville, N. C.	William Simpson, Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	Jos. E. Morrison, Montreal, Can.
Aug. 14, 1895..	Denver, Colo.	James M. Good, St. Louis, Mo.	Chas. E. Dohme, Baltimore, Md.	Adolph Brandenberger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kans.
Aug. 12, 1896..	Montreal, Can	Joseph E. Morrison, Montreal Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897..	Lake Minnetonka, Minn	Henry M. Whitney, Lawrence, Mass.	George C. Bartells, Camp Point, Ills.	Wm. S. Thompson, Washington, D. C.	Jacob A. Miller, Harrisburg, Pa.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56, and 1857–59.
James S. Aspinwall, New York, 1856–57.
Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, 1863–65.
Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–98.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.
Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.
H. M. Whelpley, St. Louis, 1893.

CORRESPONDING SECRETARIES.

William Procter, Jr., 1852–53, and 1854–57.
William B. Chapman, Cincinnati, 1853–54.
Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.
Peter W. Bedford, New York, 1860–62, and 1863–65.
John M. Maisch, Philadelphia, 1862–63.

PERMANENT SECRETARIES.

John M. Maisch, Philadelphia, 1865–Sept., 1893.

Henry M. Whelpley, St. Louis (acting), August, 1893.

Joseph P. Remington, Philadelphia, 1893–94.

Chas. Caspari, Jr., Baltimore, 1894–96.

GENERAL SECRETARY.

Chas. Caspari, Jr., Baltimore, 1896–98.

LOCAL SECRETARIES.

For the meeting held in

1867....*P. Wendover Bedford.*
1868....Alfred B. Taylor.
1869....*Henry W. Fuller.*
1870....*J. Faris Moore.*
1871....*William H. Crawford.*
1872....*Henry C. Gaylord.*
1873....Thomas H. Hazard.
1874....Emil Scheffer.
1875....Samuel A. D. Sheppard.
1876....Adolphus W. Miller.
1877....Henry J. Rose.

For the meeting held in

1878....*Jesse W. Rankin.*
1879....Eli Lilly.
1880....Charles F. Fish.
1881....William T. Ford.
1882....*Hiram E. Griffith.*
1883....Charles Becker.
1884....Henry C. Schranck.
1885....George A. Kelly.
1886....*William B. Blanding.*
1887....George W. Voss.
1888....James Vernor.

For the meeting held in

1889....Edward W. Runyon.
1890....Charles E. Dohme.
1891....A. K. Finlay.
1892....H. M. Whitney.
1893....Henry Biroth.
1894....W. G. Smith.
1895....Edm. L. Scholtz.
1896....Joseph E. Morrison.
1897....Edw. Shumpik.
1898....Henry P. Hynson.

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–91, and 1895–98.

Chas. Rice, New York, N. Y., 1891–92.

Henry Kraemer, New York, N. Y., 1892–95.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	Chairman.	*Vice-Chairman.*	*Secretary.*
1880–81	Jos. P. Remington.	*Joseph Roberts.*	Geo. W. Kennedy.
1881–82	" "	Wm. J. M. Gordon.	" "
1882–83	" "	" "	" "
1883–84	" "	C. Lewis Diehl.	" "
1884–85	" "	*John A. Dadd.*	" "
1885–86	" "	C. Lewis Diehl.	" "
1886–87	Wm. S. Thompson.	*H. J. Menninger.*	" "
1887–88	Wm. H. Rogers.	Karl Simmon.	" "
1888–89	Jas. M. Good.	*Emlen Painter.*	" "

1889–90	Jas. M. Good.	Wm. S. Thompson.	Geo. W. Kennedy.
1890–91	" "	" "	" "
1891–92	" "	" "	" "
1892–93	" "	H. M. Whitney.	" "
1893–94	" "	" "	" "
1894–95	Wm. S. Thompson.	" "	" "
1895–96	" "	Wm. C. Alpers.	" "
1896–97	" "	Jas. M. Good.	" "
1897–98	" "	" "	" "

PAST AND PRESENT OFFICERS OF THE SECTIONS.

Section on Commercial Interests.

	Chairman.	*Secretary.*
1887–88	A. H. Hollister.	*J. M. Colcord.*
1888–89	" "	" "
1889–90	Leo Eliel.	F. B. Kilmer.
1890–91	Henry Canning.	W. L. Dewoody.
1891–92	W. H. Torbert.	Arthur Bassett.
1892–93	" "	" "
1893–94	Wiley Rogers.	Jas. O. Burge.
1894–95	Geo. J. Seabury.	" "
1895–96	" "	Clay W. Holmes.
1896–97	Lewis C. Hopp.	E. D'Avignon.
1897–98	Joseph Jacobs.	Jas. H. Bobbitt.

Section on Scientific Papers.

	Chairman.	*Secretary.*
1887–88	T. Roberts Baker.	A. B. Lyons.
1888–89	*Emlen Painter.*	H. M. Whelpley.
1889–90	H. M. Whelpley.	C. F. Dare.
1890–91	E. L. Patch.	C. S. N. Hallberg.
1891–92	C. S. N. Hallberg.	H. W. Snow.
1892–93	C. T. P. Fennel.	F. G. Ryan.
1893–94	L. E. Sayre.	C. M. Ford.
1894–95	A. R. L. Dohme.	Geo. B. Kauffman.

Section on Scientific Papers.—*Con.*

1895–96	S. P. Sadtler.	W. C. Alpers.
1896–97	W. C. Alpers.	V. Coblentz.
1897–98	Edward Kremers.	A. B. Lyons.

Section on Pharmaceutical Education.

	Chairman.	*Secretary.*
1887–88	*John F. Judge.*	H. M. Whelpley.
1888–89	*P. W. Bedford.*	L. E. Sayre.

Section on Pharmaceutical Legislation.

	Chairman.	*Secretary.*
1887–88	R. F. Bryant.	W. P. De Forest.
1888–89	C. W. Day.	J. N. Hurty.

Section on Pharmaceutical Education and Legislation.

	Chairman.	*Secretary.*
1889–90	*P. W. Bedford.*	A. B. Stevens.
1890–91	Wm. Simon.	L. C. Hogan.
1891–92	A. B. Stevens.	" "
1892–93	R. G. Eccles.	" "
1893–94	" "	" "
1894–95	Jas. M. Good.	C. S. N. Hallberg.
1895–96	C. S. N. Hallberg.	Jas. H. Beal.
1896–97	" "	" "
1897–98	Jas. H. Beal.	H. Gordon Webster.

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	Albert E. Brown, 55 St. Michael St.,	Mobile.
Arizona,	Clemens L. Eschman, Washington & Centre Sts.,	Phœnix.
Arkansas,	John B. Bond, Main and Fifth streets,	Little Rock.
	William L. Dewoody,	Pine Bluff.
California,	William T. Wenzell, 322 Polk street,	San Francisco.
	George B. Flint, 1101 Broadway,	Oakland.
Colorado,	Edmund L. Scholtz, Sixteenth & Stout streets,	Denver.
Dist. of Columbia,	Walter G. Duckett, 22d st. and Penna. ave.,	Washington.
Connecticut,	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
Florida,	William Aird, Maggie & E. Brough streets,	Jacksonville.
	Sydney B. Leonardi, Franklin st.,	Tampa.
Georgia,	Robert H. Land, 812 Broad street,	Augusta.
	John Ingalls, Fourth and Poplar streets,	Macon.
	Sidney P. Watson, 137 Richardson street,	Atlanta.
Idaho,	David E. Smithson,	Emmett, Canyon Co.
Illinois,	David G. Plummer, 6 Main street,	Bradford.
	Andrew Scherer, 383 N. State street,	Chicago.
	Charles Zimmermann, 423 S. Adams street,	Peoria.

Indiana,	Henry J. Schlaepfer, Second and Main streets,	Evansville.
	George W. Sloan, 22 W. Washington street,	Indianapolis.
	Jacob Baur, 701 Wabash avenue,	Terre Haute.
Indian Territory.	Chas. G. Moore,	Eufaula.
Iowa,	John W. Ballard, 106 West Second street,	Davenport.
	Theodore W. Ruete, 568 Main street,	Dubuque.
	George H. Schafer, 713 Front street,	Fort Madison.
	Silas H. Moore, 525 Fourth street,	Sioux City.
Kansas,	George Leis, 747 Massachusetts street,	Lawrence.
Kentucky,	George A. Zwick, Eleventh st. and Madison ave.,	Covington.
	William H. Averill, 435 Main street,	Frankfort.
	C. Lewis Diehl, Third street and Broadway,	Louisville.
Louisiana,	Alexander K. Finlay, 186 Camp street,	New Orleans.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edward A. Hay, Free and Middle sts.,	Portland.
Maryland,	D. M. R. Culbreth, 203 E. Preston street,	Baltimore.
	Thomas W. Shryer, 111 Baltimore street,	Cumberland.
Massachusetts,	S. A. D. Sheppard, 1129 Washington street,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, Thompson Square,	Charlestown.
	Freeman H. Butler, 141 Central street,	Lowell.
	James E. Blake, 64 North Second street,	New Bedford.
	John H. Manning, 51 North street,	Pittsfield.
	Joseph J. Estes, Union and Church streets,	Rockland.
	Thomas B. Nichols, 178 Essex street,	Salem.
	Francis M. Harris, 814 Main street,	Worcester.
Michigan,	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	James Vernor, 235 Woodward avenue,	Detroit.
Minnesota,	Wm. A. Frost, cor. Selby & Western aves.,	St. Paul.
	Ed. Shumpik, 1921 N. Washington ave.,	Minneapolis.
Mississippi,	Joseph W. Eckford, Commerce street,	Aberdeen.
Missouri,	James M. Good, 2348 Olive street,	St. Louis.
	George Eyssell, 1036 Union ave.,	Kansas City.
Nebraska,	Autumn V. Pease,	Fairbury.
Nevada,	William A. Perkins, 84 South C street,	Virginia City.
New Hampshire,	Francis C. Miville, 1023 Elm street,	Manchester.
	Nelson S. Whitman, 175 Main street,	Nashua.
	Andrew P. Preston, 2 Congress Block,	Portsmouth.
New Jersey,	Wm. M. Oliver, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth st. & Lafayette ave.,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 861 Broad street,	Newark.
	Howard P. Reynolds, Park and North avenues,	Plainfield.
New York,	Charles H. Gaus, 202 Washington avenue,	Albany.
	Henry W. Schimpf, 365 Franklin ave.,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. Du Bois, 281 Main street,	Catskill.
	John Hepburn, 103 Main street,	Flushing.
	Harvey G. Goodale, P. O. Box 29,	Jamaica.
	James T. King, Main and South streets,	Middletown.
	John McKesson, Jr., 91 Fulton street,	New York.
	Joseph M. Schmitt, 312 North street,	Rochester.

New York,	James A. Owens, 45 Dominick street,	Rome.
	Charles F. Fish, 348 Broadway,	Saratoga.
	Charles W. Snow, 214 Warren street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
North Carolina,	William Simpson, 101 Fayetteville street,	Raleigh.
	John H. Hardin, 124 South Front street,	Wilmington.
North Dakota,	Henry L. Haussamen,	Grafton.
Ohio,	J. U. Lloyd, Court and Plum streets,	Cincinnati.
	George L. Hechler, 1099 Broadway,	Cleveland.
	Charles Huston, 47 South High street,	Columbus.
	Henry F. Kurfurst, 502 Xenia avenue,	Dayton.
	Thomas J. Casper, 41 East Main street,	Springfield.
Oregon,	Louis Blumauer, Fourth and Morrison streets,	Portland.
Pennsylvania,	Jacob A. Miller, Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 5 North Ninth street,	Lebanon.
	Richard M. Shoemaker, Fourth and Race streets,	Philadelphia.
	George A. Kelly, 101 Wood street,	Pittsburg.
	Philip M. Ziegler, 526 Penn street,	Reading.
	Edward A. Cornell, Fourth and Pine streets,	Williamsport.
Rhode Island,	Wm. H. Cotton, 226 Thames street,	Newport.
	Wm. K. Reynolds, 354 Friendship street,	Providence.
South Carolina,	Oscar E. Thomas, 164 Main street,	Columbia.
Tennessee,	Jas. S. Robinson, Second and Madison streets,	Memphis.
	C. J. Gooding, 135 Gay St.,	Knoxville.
	James O. Burge, Church and High streets,	Nashville.
Texas,	Geo. J. F. Schmitt, 507 W. Commerce street,	San Antonio.
Utah,	Frank A. Druehl, Main and 3d South streets,	Salt Lake City.
Vermont,	Geo. A. Crossman, 2 Simonds Block,	Brandon.
Virginia,	T. Roberts Baker, 919 East Main street,	Richmond.
Washington,	Henry E. Holmes,	Seattle.
Wisconsin,	Edward Kremers, 435 Park street,	Madison.
	John R. Drake, 365 East Water street,	Milwaukee.
Wyoming,	Emanuel Stuver,	Rawlins.
Prov. Nova Scotia,	William A. Simson, Pentagon Bldg.,	Halifax.
Prov. Ontario,	John Lowden, 53 Colborne street,	Toronto.
Prov. Quebec,	Henry R. Gray, 122 St. Lawrence Main street,	Montreal.

THE PERMANENT FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are three permanent Funds at the present time, all of which are invested in government bonds, in the name of the Treasurer of the American Pharmaceutical Association, and kept in the custody of the Chairman of the Council.

THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named, a revised Constitution was reported by a committee, and, after consideration, adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II., Section 7 (afterwards Section 8), contained the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings 1870, pp. 87–96), and is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the annual interest of which only shall be used by the Association for its current expenses.*"

Chapter VI., Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52) and again in 1896 (Proceedings, page 17) so as to apply also to those who have been members for over twenty years (see Chapter VII., Article 4 of By-Laws). Under this clause the life membership (new style) of the present roll is sixty-one, as published in the Proceedings.

The Treasurer's report for 1880 (page 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884

(p. 524) $944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147), it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471), the Association ordered again a transfer to the same fund of $4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the Government securities in which the Life Membership Fund is invested. The report published on page 48 of the present volume shows that on July 1st, 1897, the value of the Life Membership Fund was $10,743.43 (face value of securities only given), of which sum *the annual interest only shall be used by the Association for its current expenses.*

THE EBERT FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated *for conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products: the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, page 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize.*

The Ebert Prize was awarded for the year 1874 to Chas. L. Mitchell; for 1877, to Fred. B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; and for 1897 to Albert B. Prescott and Jas. W. T. Knox.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On July 1st, 1897 (Proceedings, p. 82), its reported value was $759.19 (face value of securities only given). The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science

connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526 528), and adopted the name *Centennial Fund.*

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings 1880, p. 553), when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII. (Proceedings 1881, pp. 190, 549). Members have not availed themselves of this Fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Rob. B. Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings 1889, page 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892, $50 to the same investigator in 1893, and $50 again to the same investigator in 1894. In 1896 the sum of $22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of $1117.81 ($525+$582.81) had increased in 1883 to $1232.76. Since 1887 the securities in which the Fund is invested are specified in the reports of the Chairman of the Council; the reported value was $1392.50 (face value of securities only given) on July 1, 1897 (see Proceedings, p. 82). *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

THE GENERAL FUND.

In October, 1891 (see Proceedings 1892, page 13), the Council instructed the Treasurer to draw from the cash on deposit a sufficient sum and purchase therewith three bonds, one thousand dollars each, the same to be such bonds as shall be approved by the Finance Committee, said bonds to be registered in the name of the Treasurer of the American Pharmaceutical Association, and placed in the custody of the Chairman of the Council.

The investment was made in bonds of the American Security and Trust Company at Washington, D. C., for the sum of $3021.62 (see Proceedings 1892, pages 27 and 28). On July 1, 1897, the above bonds were redeemed, and six (6) 4 per cent. bonds of the same company, each for $500.00, taken at par and accrued interest.

PRIZES.

The following resolutions were adopted August 15, 1893 (see page 16, Proc. 1893):

Resolved, That if worthy papers be presented, the Association award annually three prizes for the three most valuable papers, aggregating the sum of $150.00, and apportioned as follows: $75.00 for the first, $50.00 for the second, and $25.00 for the third prize.

Resolved, That a Committee of three be annually appointed by the President of the Association, their duty to be, first, to decide if one or more of the papers presented are worthy of a prize, and second, to decide upon the relative merits of such papers as are deemed worthy.

Resolved, That nothing in these resolutions shall be so construed at any time as to prevent the writer of the Ebert Prize paper from also receiving one of the Association Prizes for said paper.

For names of members of this committee see page v.

The old resolution on Prizes which the above replaces will be found on page 506 of the Proceedings for 1887.

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PREFATORY NOTICE.

At the forty-second annual meeting of the Association held at Asheville, N. C., the Council determined that the distribution of the printed Minutes, together with the papers read at the meeting, in advance of the bound volume of the Proceedings, which plan had been in operation since 1891, should be discontinued. This action of Council was approved by the Association at large at the General Session held September 8, 1894.

With the view of securing for the Proceedings as wide a distribution as possible, and to enable members to complete their sets at very low figures, the Council, at the forty-third annual meeting held at Denver, Colo., decided that the price of the Proceedings for 1890 and all previous years be reduced to one-half of that heretofore published. The Association at the General Session held on August 20, 1895, approved the action of Council, and the Committee on Publication offer the different issues at the following rates:

		PAPER COVER.	BOUND CLOTH
1851, 1852, 1853, 1854, 1855	each	$ .13	$
1857		.20	.25
1858, 1864, 1865	"	.38	
1858, 1860, 1862, 1863, 1864, 1865	"		.50
1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873	"	.50	.75
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1884, 1885, 1886, 1887	"	1.75	2.00
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1891, 1892, 1893	"	5.00	5.50
1894	"	6.00	6.50
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1896	"	5.00	5.50
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1856 and 1859 are out of print; none published in 1861.

Beginning with the first issue, in 1851, the actual cost of partial or complete sets—bound in cloth as far as on hand—will be as follows:

To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.
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1860	8	1 90	1 52	1875	22	12 90	7 74	1888	35	35 65	14 26
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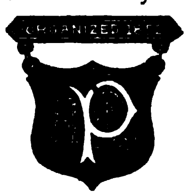
The gold badge of the Association may be procured from the General Secretary on receipt of $2.



Blank forms of applications and recommendations for membership may be obtained from the General Secretary or from the Committee on Membership; when properly filled up they should be sent to the Secretary of the Committee on Membership, Geo. W. Kennedy, Pottsville, Pa., at least one week before the meeting; if sent later, they should be addressed to him in the care of the Local Secretary, Henry P. Hynson, 423 N. Charles St., Baltimore, Md.

The forty-sixth annual meeting of the Association will convene at Baltimore, Md., on the fourth Monday (29th day) of August, 1898, at 3 o'clock p. m.

MINUTES

OF THE

FORTY-FIFTH ANNUAL MEETING.

FIRST SESSION, TUESDAY, AUGUST 24, 1897.

THE forty-fifth annual convention of the American Pharmaceutical Association was called to order at 3:30 p. m., August 24, 1897, in the Hotel Lafayette, at Minnetonka Beach, Minnesota, by President Joseph E. Morrison, in the following words:

Ladies and Gentlemen: In opening this meeting, I have great pleasure in introducing to you the Honorable Senator C. K. Davis, who will welcome you in the name of the State of Minnesota. (Applause.)

Hon. C. K. Davis spoke as follows:

Mr. President, Ladies and Gentlemen: It is a matter of extreme gratification to me, and I esteem it a very high honor to have been appointed to perform the very pleasant function of welcoming you here in the name of the State of Minnesota.

Concerning the origin of this most beneficial Association, of course those outside of it can be expected to know only in the most general way that it is one of comparatively recent origin and marks a great development, not only in the practical operation of pharmacy, but of abstract science, brought gradually to bear upon the most interesting concerns of human daily life. We think out here that it is very important, very significant and very proper that a meeting of this Association should be held in Minnesota; and in the name of the state and its good people, who are not outdone anywhere, or by any persons in the way of hospitality and good feeling, I welcome you to this state, its healthful air, its limpid waters, its life-giving climate, and trust that you will go away from us with the most pleasant recollections of the country in general, and of the good will which we entertain towards you all.

There is another special reason why we think it entirely appropriate that an assemblage of this character should meet in this state. In the early day in Minnesota the druggist, or the apothecary, was not a particularly significant factor in our affairs. The first inhabitants of this state imagined, from its healthful climate, that they had come to the fountain of perpetual youth and everlasting terrestial life. It was a place of health; there was a freedom from disease here, there was an abounding vitality in the air and in the water, which made them think, however fallaciously, that such things would continue always. They made the mistake of confounding good health with super-abundant

virility. But, in the course of time, the apothecary came and entered into the relations of our every-day life.

Perhaps I ought to stop here with simply these formal words of welcome; but, standing before an assemblage of this character, having to do with the concerns which it administers, it may be proper for us to speak some more general words upon the particular topic and subject which brings you together.

The most interesting development of our century, and which has distinguished none other which has gone before it, is the gradual application or emergence of science from its recesses in the laboratory and the workshop to bring to bear its discoveries upon the every-day well-being of human life. We see it in government; we see it in machinery; we see it in the application of many economic processes to practical affairs; but in few places, I venture to say, in any arena or avenue of improvement, has there been anything more marked, as far as the steady and increasing pressure of science is concerned, lifting up to higher planes and greater enjoyments, than in the department of pharmacy, when we consider the condition from which it has emerged and the place to which it has attained. Considering your own profession, your own art, your own science, looking over the tract of time which it has traversed in developing itself, we can see a great monumental epoch in which some great discovery has benefited the human race, coming from the laboratory of the chemist into daily application to human life by the skill of the druggist or the pharmacist. Take the invention of alcohol, that the unknown Arabian chemist gave to humanity; entering into the preparation and compounding of remedies of inestimable value to the human race.

Take another instance, that of a great chemist working in his laboratory in its secret recesses, surrounded by formulæ which common men now could not understand, bringing forth the discovery and application of ether. What a wonderful revelation it made to surgery; what marvelous processes of cure it furnished which were never expected, hoped for or dreamed of before. I picked up many years ago in the course of my studies a Pharmacopœia of the seventeenth century. It was an amazing document. The prescriptions, the recipes, the formulæ therein contained, were almost incredible, except to you gentlemen who undoubtedly know them from your studies. There the official, the mandatory code of the druggists' art, for there was no pharmaceutical science at that time, was a marvelous thing to contemplate. Mice conserved in syrup, the eyes of crabs compounded as a specific for some ailments, the moss from some human skull taken from an ancient battle field, were among the indispensable ingredients in some prescriptions. We have passed far beyond those absurdities, although a few relics of the barbarism still remain—passed far beyond it into a region how elevated, how serene, how scientific, how progressive! Who are the great pharmacists of the present day, of the last ten years? You are the privates, serving in the ranks, carrying out the orders of some of the greatest men who have commanded the forces of human intellect. Who are these great scientists? Koch, Pasteur, and the others; they are the men who, following the example of men who have gone before, following the precedent of that unknown Arabian chemist, have made those discoveries which alleviate the burdens of life and which make the hand of man a miraculous instrumentality of cure. Look at that paradox of optics, vision without radiance of light, which makes the Röntgen rays absolutely a servant, almost impossible of appreciation, as it is, as a reality. Now, these great pharmacists and discoverers and yourselves, who occupy the border and debatable line between science and use, are in possession of that undefined region. It is very fitting that you form an Association; it is very fitting that by legislation you strive to uphold your art and protect the public from the dangers and calamities of quackery and charlatanism. The attempt began long since. It took an act of parliament three hundred years ago to prevent the grocer from exercising the privileges and functions of the apothecary; and so, now, by decrees, by wise legislation, Federal and State and in the Dominion, little by

little, your profession, I may venture to say your science, has been elevated to the plane on which it belongs, and these great inventions, which I do not understand, but of which I see the beneficial effects, which it is your duty to study, and which perhaps you yet do not sufficiently understand, little by little these great inventions cease to become mysteries, but come into the ordinary applications of life.

We are all glad to see you, and we hope and wish for you prosperity. We know that good results will come from the wisdom of your deliberations, and I repeat, you are most heartily welcome to the hospitality of the good people of Minnesota. (Applause.)

THE PRESIDENT: I will next introduce Dean Wulling, of the University of Minnesota, who will extend a welcome on behalf of the Minnesota State Pharmaceutical Association. (Applause.)

MR. WULLING: *Ladies and Gentlemen of the American Pharmaceutical Association:* I have the great privilege to bid you welcome in the name of the Minnesota State Pharmaceutical Association and in the name of the pharmacists at large of the State. This occasion has been one of anxious anticipation for the pharmacists here, and especially for the men who were instrumental in bringing about the possibilities of your being with us.

Minnesota is a great commonwealth, and for me to laud its prosperous condition would be to repeat something that is common knowledge.

The pharmacists of the state are thoroughly abreast with the advancement and progress of pharmacy, and they feel that in all matters concerning the higher interest of pharmacy, in the interests of science and education, they are abreast with those who are in the front ranks.

In accordance with this spirit they attempted some years ago to be honored by your presence at some time. That time has come, and we do feel honored that you have favored us with your presence. We are glad to-day, yet we feel a responsibility of hospitality resting upon us. The hospitality of Minnesota is well known. The pharmacists have not yet had a good opportunity to display their hospitality, and they desire to show it at this time. They desire to make your stay as pleasant as it is in their power to make it, but they want your co-operation in so doing. They want you to feel thoroughly at home among them. Let every one of us shake the hand of every pharmacist; let us dispense with the ceremony of formal introduction; let us greet one another and become acquainted, if we are not already acquainted. I, for one, do not know the majority of those whom I am addressing. I want to know every one, and I speak the sentiment of every pharmacist in the State when I make that statement. Every pharmacist wants to know every visitor, and you may help us to become acquainted with you all.

We feel that by your association with us much profit will accrue to us, being always and ever mindful of the profits of good association. We feel that we indeed are enjoying a privilege to have so representative an assemblage with us. We want to profit not only by your association, but also by your deliberations and by attendance upon your sessions; and we feel that in mingling with us you are not only giving us alone a profitable time, but that you will learn of the state of pharmacy in this State and that you will become acquainted with the high status of the pharmacists' rank here. The general idea that prevails among men who are not acquainted with any of the western states is that there is a crudeness here among pharmacists, and among some of the trades, and among men engaged in commerce and in professions. I have had that idea expressed to me not long ago when I was in the East, and I am especially glad that there are so many representative men here who can go back to the various parts of the country and take with them the knowledge that such impression, if they have had it, is an erroneous one.

I again bid you welcome in the name of the pharmacists of the State Association and of the State. I bid you welcome to these charming grounds, where Nature seems to

have adorned herself in her most superb garb, and bid you welcome to our midst, to the best we have. We bid you an earnest, a sincere and a hearty welcome. (Applause.)

THE PRESIDENT: Gentlemen, you have been welcomed in behalf of the State, also in behalf of the Pharmaceutical Association of this state, but there still remains one important act, namely, the welcome on the part of the municipality of Minnetonka Beach. Now, it was the custom at one time to present the freedom of a city with keys in a golden casket; I do not know that Minnetonka Beach has any keys in a golden casket. but I am very sure she will present us with a welcome in the silvery tones of her Mayor, Mr. J. C. Eliel. (Applause.)

MR. ELIEL: Mr. President, ladies and gentlemen, I need not assure you that it is a very great pleasure to perform my humble duties upon this occasion, and to assist my predecessors in welcoming you to what the country editor would call "our midst." Knowing that so many of you are from distant parts of the country, I am glad to see you, glad also that you have to so large an extent brought with you those flowers of loveliness, which alone can make your convention a successful one. (Applause.)

I do not care to waste my time talking to men, just every-day men, for I am doing that all the time; but it is always a pleasure, and a very great pleasure, to talk to the ladies, and to say a few words upon those topics which most interest them, and I speak feelingly as a married man. They are the Bible and the grammar. Why, I can't say "good morning" without being corrected in my grammar at home, (laughter) and so I always take occasion when I have an opportunity like this to tell the ladies a few old chestnuts. Speaking of grammar, I once heard the teacher of a Sunday-school class ask boys to form a sentence in which the three words, "bees, bear," and "boys" should be used in their proper sequence, and promptly one little hand went up and she said, "Johnnie, have you got one?" The boy nodded his head and she asked, "What is it?" He said "Boys bees bare when they go in swimmin'." (Laughter and applause.)

The long-haired poet of the Sierras told a little story about one female peculiarity, which some of the most observant of you may have noticed. It was a Bible story, and for that reason it has always been popular with the ladies. (Laughter.) I do not know just where it is in the Bible, but I think it is in Revelations. (Laughter.) I think it is where the Lord constructed the world, but perhaps I am mistaken about that. In the first place, I believe He said, "Let there be light"; then He separated the water from the earth and rested; then He created the sun, moon and stars, and again He rested; then He created man and again He rested, and he said upon that occasion he hoped He took a long rest, because the next thing He did was to create woman, and there is no record in the heavens above, in the earth beneath, or in the waters under the earth, that either God or man has ever rested since. (Prolonged applause and laughter.)

Now, Mr. President, seriously, it is a very great pleasure to be with you to-day for a few moments, and to welcome you to the great North Star State; a state whose welfare and good name are enshrined in the loyal heart of its every citizen from the highest to the humblest. We have much here of which we are proud and justly proud—proud of our lovely climate and bracing air, we are proud of this wonderland of the North, of which Longfellow sang in deathless verse, for it is here that Gitchie Manitou the Mighty called the nations together and bade them wash the war-paint from their faces and smoke the pipe of peace. It is here that Minnehaha "laughs and leaps into the valley," and we are proud of its tinkling babble and liquid laughter. We are proud of this great domain of blooming prairies stretching away upon either hand, sun-kissed and wind-swept, reaching out beyond the imagination of man, and whose cereal waves lave the distant horizon like the great waters of a vast inland sea. We are proud of our twin metropoli, which, together, form one of the great industrial and commercial centers of the United States; proud of St. Paul (laughter), stately, solid and substantial; proud of Minneapolis, mod-

ern and modest (prolonged applause and laughter), that great city which, like the infant Hercules, while still in its cradle strangled the mighty Mississippi and, turning aside its life current, harnessed it to those mills which are her special pride. We are proud of beautiful Minnetonka, and, last, but not least, we are proud of our little community of lake dwellers, of which I have the honor to be a sort of figure-head. (Laughter and applause.) For ourselves, at least, we have solved, and successfully solved, one of the greatest problems which presents itself to the American people, and that is municipal government. We have here, even if small, an ideal government. We do not know what a practical politician is. We have no ward heelers, no strikers; we levy and pay our taxes, and there has never been the faintest suspicion that any part of these has ever remained in the hands of those whose duty it was to collect them.

In addition to welcoming you on behalf of the inhabitants of this little community, I also represent on this occasion the Proprietary Association of the United States, whose delegate I am to your honorable body, and, at the proper moment, I shall take pleasure in presenting my credentials from President Doliber, and take occasion to say a few words of greeting from those proprietors who still consider the druggist the proper channel through which to distribute their goods. Added to this dual duty, I am also a delegate from the National Wholesale Duggists' Association, so I ask you to look at me a moment and then allow me to take myself away with these parting words:

We are glad to have you with us. We trust that your meeting may prove both pleasant and profitable, that those problems which present themselves, both scientific and commercial, may be easy of solution, and that, when you return to your distant homes, you will take with you pleasant memories of your visit to Minnetonka Beach, as we know you will take with you our best wishes for your continued welfare and success. (Prolonged applause.)

THE PRESIDENT: I will call upon Prof. Good, of St. Louis, to respond on behalf of the Association to the addresses of welcome.

MR. GOOD: *Mr. President, Ladies and Gentlemen:* I appreciate that this is no easy task, to respond to the very eloquent words of welcome which have come from the three gentlemen who have preceded me. One of the stories told by Mr. Eliel reminds me of the expression of the country editor which will serve as a companion-piece to his. He says, "For the result of last night's debauch, see our inside." (Applause.) In regard to his biblical allusion, it recalls to my mind the conundrum that the small boy gave at the breakfast table. He said: "When was base-ball first mentioned in the Bible?" Everybody gave it up. It was not in Revelations (laughter), it was in the "big-inning." (Laughter.)

Senator Davis has welcomed you in very eloquent words on behalf of the State of Minnesota. He alludes very appropriately to the condition of science in the centuries of the middle ages. He thinks we have left those superstitions behind, and most of them we probably have, but we have certain of them that remain with us yet. Some of them have been resuscitated in the past few years. There is a revival of the faith, perhaps not now growing, but a sort of confidence that there is virtue in the animal extract; and I would tell him that there are those among us who carry around with them in their pockets, the "left hind leg of a graveyard rabbit, killed in the dark of the moon."

When your delegation came to Denver first, and last year came to Montreal and renewed with such urgency the invitation to come to Minnetonka, we accepted. We did not think that we were going to make any mistake by accepting, and since we have come here we know we have not made a mistake. (Applause.) I regard it, and am speaking for the Association now, remember, as the ideal place for a meeting. It is beautiful, it is comfortable, and we have altogether here the conditions favorable for a good meeting. The Twin Cities vie with each other in their efforts to entertain us, and they are as much

a unit as the Siamese twins, perhaps more so. They are as one in taking care of us and giving us a good welcome, and assuring us a good time.

In regard to the welcome from the State Association, I think we can assure the gentleman that we have no such impression of the Minnesota druggists as he thinks may possibly have gone abroad. We realize when we are here at this place that we are really only at the gateway of the great Northwest, and, therefore, the magnificence and the greatness and the possibilities of our country are impressed upon us, to say nothing about the wheat and the gold, or any comparison between the two, which lie beyond. We are here primarily for business, but, of course, incidentally for pleasure, and I have no doubt that we will succeed in having a great deal of pleasure and can transact a great deal of business.

I think it is unnecessary for me to prolong these remarks. We accept with much pleasure the cordiality with which the little municipality, if they so call it, has greeted us, and the freedom which has been offered. We hope to know you better. As we come together from year to year, we carry away with us beautiful pictures, and we take with us from here companion pictures of those which are on our minds, impressed there at Asheville, later at Denver, and more recently at Montreal and Quebec, and those of you who attend these meetings pretty regularly, know what a joy it is to come together and see old friends again and to make new ones, and so I predict for our friends here an enjoyable time. (Prolonged applause.)

The President having requested Vice-President Payne to take the Chair, proceeded to deliver the following address:

Ladies and Gentlemen: For the first time in our history we meet within the confines of what may be called the Northwestern States. After going all over this vast country and into Canada, we have come to admire the natural wonders and beauties of this section and to make more extended acquaintances among our brethren. When our Minnesota brethren, a year ago, came to our meeting and extended an invitation to us to convene

"In the land of the Dacotahs,
Where the Falls of Minnehaha
Flash and gleam among the oak trees,
Laugh and leap into the valley."

it was gladly accepted, and we have since been living in anticipation of gazing upon the beauties of Lake Minnetonka, a gem set by the hands of the Almighty in the midst of this fair land; nor have we been disappointed; although we had been prepared for beautiful sights, the realization exceeded the anticipation, and one glance from the shores of this lake has repaid us for the toil of our journey.

However, we do not come here to indulge in poetic flights of fancy, but to discuss the hard, matter-of-fact interests of to-day, an undertaking devoid of any tendency towards poetic license. Unfortunately, we pharmacists have not much time to cultivate the Muses, as our attention is too closely concentrated on the grosser things of material earth, so we will dismount from our Pegasus and stand on solid ground.

This Association was asked by the State Department to name delegates to represent the United States at the Brussels International Pharmaceutical Congress, and by virtue of authority granted by the Council I named Prof. J. P. Remington and Mr. Louis Dohme as such delegates, and Mr. Alfred Meyer, of New Orleans, and Dr. F. B. Power, now of London, England, as alternates.

The reports of the various committees will show that the work of the Association has been carried on with the same enthusiasm and generally successful results.

I desire, however, to draw attention to the very effective work done by the Committee on National Legislation, especially as regards tax-free alcohol, which requires eternal vigilance on the part of the committee to guard against attacks from unexpected quarters, as evidenced by the proposal made in the Senate to tax wood alcohol, which, if successful, would have had serious results. Happily, the Secretary of the Committee, Mr. A. E. Ebert, is one of those who is always on guard and never sleeps at his post, so that as soon as the proposition was made Mr. Ebert immediately telegraphed to over eighty of the Senators, protesting in the name of this Association against any such taxation, and we think we are justified in claiming that Mr. Ebert's prompt and energetic action was the main cause of the rejection of Senator Lindsay's motion.

The first question which I desire to take up is that of membership. For several years our numbers have fluctuated between fifteen hundred and two thousand. The last report of the Membership Committee showed that we had eighteen hundred enrolled in this Association. At the same time the secretary of the Section on Legislation and Education in his report stated that there were 51,000 druggists in the United States and 2,000 in Canada, making a total of 53,000 from which we can draw for our members. The discrepancy thus revealed between our membership and the total number of pharmacists is indeed very striking; and, even admitting that 53,000 represents good, bad and indifferent, and perhaps many who would or should not be deemed desirable to have as members, there still remains a great field for earnest work in the direction of recruiting our ranks. Five thousand is a moderate estimate to make of what our numbers should be before we can become, as has been suggested, a delegate organization such as the American Medical Association, or before we can hope to wield the influence to which our organization is entitled by reason of the high objects which it has in view.

The securing of new members is a matter which has heretofore been left solely and entirely in the hands of the committee charged with this work. That committee has been unremitting in its efforts, and I know that the chairman and members of the Auxiliary Committee have rendered yeoman service. While, however, expressing my appreciation of the valuable work done by these gentlemen, I will avail myself of the opportunity offered to state that on the part of the members at large more could and should be done towards increasing our membership. Every member of the Association should constitute himself an auxiliary member of the Auxiliary Committee and should take advantage of every occasion which presents itself for setting out the benefits to be derived from, or enlisting the sympathy and active interest of fellow pharmacists in this Association.

It has been brought to my notice that many valuable papers are presented at the annual meetings of the State Associations by members of this body; and that these papers would be presented at our meetings if the State Associations were not in existence. Among these papers are to be found many worthy of a wide circulation, and of being preserved in more permanent form than that offered by the usual volume of State Association proceedings. I would therefore suggest that an arrangement be entered into with the State Associations by which we would be permitted to publish these papers in our proceedings, subject to the approval of our Committee on Publication. We would thus secure what is best and most worthy of preservation among these papers, and also make our Annual Proceedings a more complete record of pharmacal progress in this country.

The Treasurer's report will contain a statement of the number of members who have been delinquent in the payment of their fees, and who will be dropped from the rolls. The number of delinquents has been increasing of late years, and it is not difficult to assign the principal reason for this state of affairs. It is due simply to the changed and changing conditions of pharmacy. The pharmacist, originally a manufacturer, and a combination of chemist, botanist, and merchant, has allowed the last mentioned to greatly overshadow the others, and has become almost entirely a dealer in patent medicines, toilet

articles, soda water and drugs. The laboratory is not to be found in connection with modern pharmacy. Everything which should be made is bought from the wholesaler or manufacturer. Pharmacy as a profession is apparently a thing of the past, and is now but a trade or mercantile pursuit. But I believe that we are now going through one of the transition stages in the process of evolution which governs all things, and that we will find our present troubles to have been a fire of purification in preparation for a new era in which pharmacy will be differentiated into a profession and a trade. We see evidences of this in the pharmacal journals and the colleges. We find the former devoting a large amount of their space to the matter of advertising and other strictly commercial topics, showing that the mercantile feature is rapidly developing. On the other hand, we find the colleges are increasing the number and length of their courses. Subjects which some years ago were thought unnecessary or useless are now included in the curricula, and pharmacy by them is regarded as a profession alone.

Can the average individual put into practice his college instruction in chemistry, pharmacy, pharmacognosy, microsopy, etc., and at the same time look sharply after the buying and selling of the thousand and one items which go to make up the stock of the modern pharmacy? Impossible. And a change must come, and we must prepare for it. If we desire to follow pharmacy as a trade we must adopt the methods of other trades. We must buy in the cheapest market. sell as cheaply as our neighbor; use printer's ink on every possible occasion, and in every possible way; and, in a word, spare no effort to increase our trade. But then we must be prepared to stand the fierce fire of commercial competition, and cannot claim, because we are druggists, any more protection than that given other merchants. As it is now, we have gone outside of our own territory, and invaded that of every other trade, and added their goods to our stock under the name of "side lines." We find cigars, books, stationery, paints and oils, etc., forming the bulk of the stock of many so-called pharmacists; and we find, as a rule, that the proprietors of these establishments complain of their neighbors selling perfumes nd patent medicines.

Remedies innumerable have been proposed for the present depressed condition of pharmacy. You cannot control commerce; trade will seek its own channels in spite of laws or obstacles; and, as far as I can see, there is only one way out—that is, to return to pharmacy proper; devote more attention to the laboratory; cultivate more cordial feelings with the medical profession, and strike for higher ideals. The higher the standard we set up, and the closer we approach to it, the greater will be the esteem in which we will be held by the public.

One of the first requisites for the elevation of the profession is more stringent pharmacy laws, and more especially as regards examinations. In this connection, I would say, that the Section on Legislation and Education will present for our consideration a model pharmacy law.

Now, I wish to draw attention to what I consider a fault in all American pharmacal legislation. As far as education is concerned, they all begin at the wrong end. By this I mean that no supervision is exercised over students or apprentices in drug stores. It is the almost universal custom of the drug store to take any boy applying for a position, without any examination as to his mental equipment and general fitness for the profession; and, if he does his work reasonably well, he is promoted from errand boy to clerk, and then to dispenser, and, after three or four years' service, he commences to prepare for his examination, in which, by means of quiz compends and other cramming devices, he succeeds. Of course there are exceptions, but I believe that the number of college graduates is out of proportion to the number of young men employed in drug stores. If pharmacy is to become a profession we must commence with the beginners. We must have a class of men who have acquired a sound foundation upon which to erect the composite structure which we call the science of pharmacy. If the law recognized a class of

apprentices, and compelled all desiring to study pharmacy to pass an examination in such subjects as arithmetic, history, geography, elementary algebra, and one modern language besides English, either German or French, before a board named by the Board of Pharmacy, and consisting of two or more well-known high school teachers, a superior class of young men would be attracted to the study of pharmacy proper, who would almost invariably become college graduates, and would aim at becoming proficient pharmacists rather than merely passing the board examination. This requirement would also lessen the number of clerks and pharmacists and decrease competition, which is one of the greatest evils of the present system.

The delegation to the American Medical Association will bring before you for consideration a most important question, viz.: Shall brandy, whiskey and wines be retained in the next revision of the Pharmacopœia? There is no necessity for my dilating on the evils of the liquor traffic and the incalculable amount of injury it has done to American pharmacy. The pharmacists of the United States are at present in a peculiar and humiliating position; for just as long as liquors are sold in pharmacies, even if only on prescriptions, will we be in the eyes of the Government on the same footing as saloon-keepers. It is time that this conditions of things were terminated by the complete abolition of every form of dealing in fermented or spirituous liquors. A great advance in that direction will have been taken when it shall be decided to delete all such preparations from the Pharmacopœia. For my part, I believe that the sale of liquors by pharmacists is unnecessary, and is simply the result of a bad habit into which we have allowed the public to fall. In the province of Quebec, pharmacists do not deal in liquors. The physician, when desirous of prescribing stimulants, invariably sends his patient to the grocer; and in all my experience of twenty years as a retail pharmacist I do not believe I have had to sell a quart of liquor except during the time I was employed in this country. I am not a temperance crank, but I think that the sale of liquor is degrading to the profession of pharmacy, and is an unmitigated evil. The only excuse which I have heard advanced for the retention of this class of preparations in the Pharmacopœia is that we have a standard by which to test our goods. Now, let us examine the reliability of this standard. Under "Spiritus Frumenti" we find the Pharmacopœia says: "Its specific gravity should not be more than .930 nor less than .917, corresponding, approximately, to an alcoholic strength of 45 to 50 per cent. by weight, or 50 to 58 per cent. by volume"—a rather wide margin. And is the test for impurities any more reliable? Under "Spiritus Vini Gallici," we find that "its specific gravity should not be more than .941 nor less than .935, corresponding, approximately, to an alcoholic strength of 39 to 47 per cent. by weight, or 46 to 55 per cent. by volume." The tests for fusel oil, etc., are not more definite than under "Spiritus Frumenti." An examination of the tests for wines will show that they are not more definite. Admitting that the tests are sufficiently exact, I would like to ask, How many pharmacists test their liquor purchases to see if they answer the requirements of the Pharmacopœia? Furthermore, of what benefit is the standard to us, when the price we have to pay for it is the levelling of the profession of pharmacy in the eyes of the Government and of the public to that of the saloon-keeper? The price is too great to compensate for any imaginary, or even possible or probable, advantages.

I have only touched upon one phase of the question. The therapeutical aspect is one outside of our province. The strictly pharmacal use of wine as a menstruum I have not dealt with, but I consider that the class of wines could be very easily replaced by preparations made with a dilute spirit of the same alcoholic strength.

Another important question which we should take up is that of patented medicinal compounds. During the past ten or twelve years a number of organic compounds, principally of German origin, have been patented and introduced into this country. One peculiarity of these is the very high price charged here in comparison with that ruling elsewhere. I give a comparative statement of prices which obtain in the United States and in Canada:

	U. S. A.	Canada.
Phenacetin	$1 00	$0 35
Sulfonal	1 35	30
Trional	1 50	1 00
Chloralamid	90	35
Antipyrine	1 40	1 10

Now, why should the people of the United States be compelled to pay such exorbitant rates as shown here? It is really due to the patent laws of this country, which allow a patentee to cover everything within his reach. Patent laws are avowedly designed for the encouragement of inventive genius by guaranteeing to an inventor an adequate return for the trouble and study required for the invention of new appliances, new methods, etc., and it is as much to the United States Patent Laws as to any other cause that this country owes its proud preëminence in the manufacturing world.

In the matter now under consideration, I venture to say that such a contingency was never foreseen by the framers of the law. Nor do I think it was ever intended that the law should have any such results as have come from its application to the invention or discovery of new remedial agents. One of the objects of the law was the encouragement of inventive genius. Has it operated in this case? No. For not a single new synthetic compound has been discovered and brought to completion in this country since the flood of synthetics first began to pour into the United States. The only result has been the enriching of a few at the cost of the whole country, and, as a matter of fact, the American people have been paying foreigners millions annually for taking advantage of the privileges granted by the United States patent laws.

Looked at in any light except in that of the German patentee and his American representative, this position of affairs is intolerable, and it is for us to draw the attention of the legislators of this country to the gross iniquity perpetrated upon the sick. Germany is the home of these preparations, but an examination of the German patent laws shows that such preparations as those we speak of cannot be patented. The patent law of April 7, 1891, says:

"Patente werden ertheilt für neue Erfindungen welche eine gewerbliche Verwerthung gestatten. Ausgenommen sind:

"Erfindungen deren Verwerthung den Gesetzen oder guten Sitten zuwiderlaufen würde.

"Erfindungen von Nahrungs, Genuss und Arzneimitteln, sowie von Stoffen welche auf chemischem Wege hergestellt werden, soweit die Erfindungen nicht ein bestimmtes Verfahren zur Herstellung der Gegenstände betreffen."

Which means that discoveries of food stuffs or medicinal preparations or bodies which may be prepared by a chemical method cannot be patented, but that the method of preparation of these objects may be.

Now, if German manufacturers cannot patent their products in their own country, why should they be allowed to do so in this?

Turning to France, we find the law of July 5, 1844, and which is still in force, says:

"Ne sont pas susceptibles d'etre breveter, les compositions pharmaceutiques ou remèdes de toutes especes, les dites objets demeourant soumis aux lois et reglements speciaux sur la matiére, et notamment au dècret du 18 août 1810 relatif 'aux remèdes secrets.'"

"May not be patented, first, pharmaceutical compounds or remedies of every sort, these articles remaining subject to the special laws and regulations on this subject, and particularly to the law of August 18th, 1810, relative to secret remedies."

Again we find in a recent report of the Commission appointed by the French Minister of Public Instruction to prepare a new Pharmacy Act, that they propose the following clause to be added to Article 9, which sets out that none but pharmacists shall sell remedies, either compound or simple, used in human or veterinary medicines:

"Ces medicaments et leur mode de preparation ne pourront faire l'objet d'un brevet d' invention; leur denominations scientifiques ou commerciales tombent dans la domaine publique et ne pourront devenir propriété privative ni constituer à elles seuls une marque de fabrique. Les remèdes secrets restent prohibés."

"These remedies and their method of preparation cannot be made the subject of a patent. Their scientific or commercial names fall into the public domain, and cannot become private property nor constitute in themselves a trade-mark. Secret remedies remain prohibited."

These quotations require no comment.

If the patentees of these remedies were satisfied with a reasonable profit, we might not complain. It might be claimed that the great expense of advertising and introducing these preparations necessitates high prices; but does it cost more to advertise these goods in this country than it does in Germany or England or Canada, where the prices are so much lower? And is it not a fact that most of the advertising is free? Do we not see, month after month, communications in the medical press on the action of the new synthetics in certain affections? This is the most effective kind of advertising, and it is impossible to imagine that the journals in which these articles appear would receive pay for their publication. There is no reason for the high prices charged for these goods, but the knowledge of the patentees that with the process and product patented and the name copyrighted, they have an absolute monopoly, and can charge just what they please. What we want is that the patent laws be changed on the lines of German laws, which, while safeguarding the public from extortion, gives ample protection to the patentee. We should demand that products used in medicine should not be patented, and that the names by which they are known in commerce should not be copyrighted.

On this subject a resolution was presented and adopted at the last Convention, but it did not go far enough. I would therefore suggest that although this work would be within the province of the Committee on National Legislation, a special committee composed of one member from each state and territory, and all members residing in the District of Columbia, be appointed to undertake and carry on an agitation for the amendment of the United States Patent Laws on the lines already indicated.

I would also suggest that our delegation to the American Medical Association be instructed to bring this matter before the next convention and secure the endorsement of that body; that we also secure the co-operation of all the State Associations through their delegates present at this Convention, and, in fact, employ every legitimate means to accomplish our object.

Upon motion of Mr. Kennedy, seconded by Mr. Hallberg, the President's address was referred to a committee of three for the purpose of considering and reporting upon the suggestions made therein.

Vice-President Payne appointed as such committee, Messrs. Ebert, Thompson and Whelpley.

The President, having resumed the chair, called for the Reports of Committees, which were read by title as follows, action upon same being deferred until the next session:

The Committee on the Revision of the Pharmacopœia.—Leo Eliel, Chairman.
" " *General Prizes.*—F. S. Hereth, Chairman.
" " *Membership.*—H. M. Whelpley, Chairman.
" " *The Ebert Prize.*—H. H. Rusby, Chairman.
" " *National Legislation.*—F. E. Stewart, Chairman.
" " *Transportation.*—Edw. Shumpik, Chairman.
" " *Finance.*—Chas. E. Dohme, Chairman.

The Auditing Committee.—Lewis C. Hopp, Chairman.
" *Committee on Publication.*—C. Lewis Diehl, Chairman.
" " *Tax-Free Alcohol.*—W. S. Thompson, Chairman.
" " *Beneficiary Features.*—C. S. N. Hallberg, Chairman.
" " *Meeting of 1900.*—Wm. C. Alpers, Chairman.
" " *Status of Pharmacists in the U. S. Army, Navy and Marine Hospital Service.*—G. F. Payne, Chairman.
The Committee on Weights and Measures.—F. G. Ryan, Chairman.

THE PRESIDENT: The next business before us is the formation of the Nominating Committee, and we will take a recess of five minutes to allow the delegates time for consultation as to who shall represent their state on this committee.

After a recess of ten minutes the Association re-convened, and the President proceeded to a roll-call of the States, Territories and Provinces, for the purpose of ascertaining the names of members selected to serve on the Nominating Committee. The following gentlemen were named:

Arkansas—W. L. Dewoody, J. L. Sparks.
Colorado—C. M. Ford.
Georgia—Joseph Jacobs, G. F. Payne.
Illinois—C. S. N. Hallberg, O. Oldberg.
Indiana—F. W. Meissner, Jr., Geo. W. Sloan.
Iowa—C. D. Wangler, Fletcher Howard.
Kansas—L. E. Sayre.
Kentucky—G. A. Newman, A. J. Schoettlin.
Louisiana—T. A. Quayle, H. V. Arny.
Maryland—Chas. E. Dohme, Chas. Caspari, Jr.
Massachusetts—E. L. LaPierre, Chas. E. Coombs.
Michigan—F. E. Stewart, A. B. Prescott.
Minnesota—Chas. T. Heller, J. E. Stiles.
Missouri—Francis Hemm, H. M. Whelpley.
Nebraska—N. A. Kuhn, J. H. Schmidt.
New Jersey—Jacob Betzler, W. T. Brown.
New York—G. Ramsperger, C. A. Mayo.
North Carolina—J. H. Bobbitt.
Ohio—Geo. B. Kauffman, L. C. Hopp.
Pennsylvania—J. A. Miller, Jno. F. Patton.
Rhode Island—Mason B. Wood.
South Dakota—E. C. Bent, L. T. Dunning.
Texas—I. F. Orton.
Virginia—T. A. Miller.
District of Columbia—W. S. Thompson.
Indian Territory—J. L. Beardsley.
Province of Manitoba—Chas. Flexon.
Province of Quebec—J. E. Morrison, H. Willis.

As delegates at large on the Nominating Committee, the President appointed A. E. Ebert, of Illinois; A. K. Tilden, of Massachusetts; James M. Good, of Missouri; Wm. A. Frost, of Minnesota, and Thomas F. Main, of New York.

By request, the President announced that the Nominating Committee will meet immediately after adjournment of this session, and then called for the reading of the minutes of the Council, as the next business in order.

The Secretary of Council, Geo. W. Kennedy, read as follows:

FIFTH SESSION OF THE COUNCIL—AUGUST 24, 1897.

Council convened at 11 a. m. in the Hotel Lafayette at Minnetonka Beach, Minn. Chairman Thompson presided, with the following members present: Messrs. Alpers, Caspari, Dohme, Ford, Frost, Good. Hallberg, Hopp, Kennedy, Morrison, Parisen, Payne, Sheppard, Shumpik and Whelpley.

H. M. Whelpley reported that in compliance with instructions from Council, fifty gold bars had been made for this meeting and delivered to the Local Secretary.

The Secretary of the Committee on Membership presented the names of eighty-one (81) applicants for membership. On motion of G. W. Kennedy, duly seconded, the list was referred to the Association with favorable recommendation.

The Secretary of Council presented the following items of business which had come before this body since the last session and which were disposed of by correspondence:

POTTSVILLE, PA., *September* 12, 1896.

Dear Sir: It is moved by Chas. Caspari, Jr., and seconded by Geo. W. Kennedy, that the President be authorized to increase the Special Auxiliary Committee on Membership by the appointment of such additional members for the larger cities as in his judgment may be desirable.

Please send your vote to the undersigned.

Yours truly, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Ford, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—21.

POTTSVILLE, PA., *September* 24, 1896.

Dear Sir: It is moved by H. M. Whelpley that the General Secretary be requested to have one hnndred extra copies of the Constitution and By-laws of the Association printed for the use of the Committee on Membership. Seconded by J. M. Good.

Please send your vote to the undersigned.

Yours truly, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—20.

Nays—0.

Not voting—Ford.

POTTSVILLE, PA., *September* 25, 1896.

Dear Sir: The Special Committee on the Status of Pharmacists in the Army and Navy of the U. S. requiring a considerable number of copies of the Report, made by them to the Association at Montreal, Can., August, 1896, it is moved by the undersigned that the General Secretary be directed to have 1000 copies of said Report printed for the use of the Committee. GEO. F. PAYNE.

Seconded by Chas. Caspari, Jr.

Please send your vote to the undersigned.

Yours truly, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Ford, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—21.

POTTSVILLE, PA., *October* 5, 1896.

MR. W. S. THOMPSON, *Chairman of the Council of the A. Ph. A.:*

I move that the Secretary be instructed to make use of the picture of the late Dr. Charles O. Curtman as a frontispiece to the 1896 volume of Proceedings. The cut to be furnished the Association free of charge. H. M. WHELPLEY.

Seconded by J. M. Good.

In submitting the above motion the Chairman desires to say that, the subject being one of importance, the vote on the motion will not be announced until the 20th inst., to

afford time for the consideration of any amendatory or counter proposition that in the meantime may be offered. W. S. THOMPSON, *Chairman of Council.*

Please send your vote to the undersigned.

Yours truly, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Ford, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Thompson, Whelpley—19.

Nays—Watson—1.

Not voting—Shumpik—1.

POTTSVILLE, PA., *December* 10, 1896.

Dear Sir: The Academy of Pharmacy of Cincinnati, Ohio, apply for permission to publish an epitome of the National Formulary, for the purpose of circulating it among the physicians of that city.

It is moved by William S. Thompson, and seconded by Geo. W. Kennedy, that the above request be granted.

Please send your vote to the undersigned.

Yours truly, GEO. W. KENNEDY, *Secretary af Council.*

Yeas—Messrs. Alpers, Diehl, Dohme, Ford, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Whelpley—18.

Nays—0.

Not voting—Caspari, Frost, Watson—3.

POTTSVILLE, PA., *February* 1, 1897.

WHEREAS, the money formerly (prior to 1895) carried on the books of the Treasurer under the head of "Entertainment Fund," was by special action of Council approved at a general meeting of the Association (see Proc., 1895, p. 61) merged into the general funds of the Association and thus made available for general expenses and investment, as in the judgment of the Council or the Treasurer may seem desirable; and

Whereas, The annual income of the Association has been greatly reduced of late years by the non-payment of dues of members, and investments from the General Fund have on that account not been deemed practicable.

It is therefore moved by the undersigned that hereafter all money that may come into the hands of the Treasurer from any local Committee of Arrangements, unless otherwise specified, shall be added to the General Fund, to be used for the purposes of said fund as above stated. CHAS. CASPARI, JR.

Seconded by Charles E. Dohme.

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Gordon, Hallberg, Hechler, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—19.

Nays—0.

Not voting—Ford, Hopp—2.

POTTSVILLE, PA., *March* 27, 1897.

WHEREAS: The date of the opening of the Forty-fifth Annual Meeting of the American Pharmaceutical Association coming on Monday will make it impossible for those from the East, who desire to attend this meeting, to take advantage of the Lake route, (the boat arriving at Duluth on Fridays and Mondays, p. m.);

Therefore I move that the date of opening of the Forty-fifth Annual Meeting be made Tuesday, the 24th day of August, instead of Monday, the 23d day of August.

WILLIAM A. FROST.

Seconded by E. Shumpik.

WASHINGTON, *March* 28, 1897.

To the Members of the Council:

In addition to the reasons named in the motion of Mr. Wm. A. Frost for changing the day for the next meeting, I am informed by Mr. Charles T. Heller, Secretary of the Minnesota Pharmaceutical Association, that it is the wish of the pharmacists of that State to have their state meeting the same week and at the same place as ours. And for this purpose they want to occupy the whole of Monday, August 23, so as to be prepared to enjoy, without interruption, the "good things" to be presented by the American Pharmaceutical Association.

Believing that, had the facts here presented been laid before our meeting at Montreal, the date now asked for, Tuesday, August 24, would have been adopted, I feel justified in submitting to the Council for its action, a motion repealing a formal vote of the Association on the same question; trusting that the action of the Council will in the end be approved by the Association at Lake Minnetonka.

W. S. THOMPSON, *Chairman of Council.*

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Ford, Frost, Good, Gordon, Hallberg, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—20.

Nays—0.

Not voting—Hechler—1.

POTTSVILLE, PA., *April* 29, 1897.

WHEREAS, the Belgian minister has informed the U. S. Government that the 8th International Pharmaceutical Congress will be held at Brussels in the month of August, 1897, and has made special request that the United States be represented, and

Whereas, the U. S. Commission to the International Exposition of Brussels has officially requested this Association to name two delegates and two alternates to represent the United States at the Congress above designated;

Therefore, it is moved by the undersigned, that the President be authorized to make the appointments, so that the names may be submitted to the U. S. Commission for confirmation, by the Secretary of State.

CHAS. CASPARI, JR.

Seconded by Charles E. Dohme.

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Ford, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—20.

Nays—0.

Not voting—Frost—1.

POTTSVILLE, PA., *May* 21, 1897.

Dear Sir: It is moved by the undersigned that the Treasurer be directed to transfer the unexpended balance of \$38.35, remaining from the appropriation for traveling expenses, to the accounts of Miscellaneous Expenses and Printing and Stationery, the appropriation made for these items for the present fiscal year appearing inadequate.

CHARLES E. DOHME.

Seconded by Chas. Caspari, Jr.

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Gordon, Hallberg, Hech-

ler, Hopp, Kennedy, Morrison, Parisen, Sheppard, Shumpik, Thompson, Watson, Whelpley—19.

Nays—0.

Not voting—Ford, Remington—2.

POTTSVILLE, PA., *June* 21, 1897.

Dear Sir: Whereas the three debenture bonds belonging to the General Fund, have been called for payment by the American Security and Trust Company, of Washington, D. C., therefore;

It is moved by S. A. D. Sheppard and seconded by W. S. Thompson, that the Chairman of the Council be authorized to exchange the three five per cent. debenture bonds now in his custody, belonging to the General Fund, for three of the four per cent. debenture bonds to be issued by the American Security and Trust Company, of Washington, D. C.

Please send your vote to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Shumpik, Thompson, Watson, Whelpley—20.

Nays—0.

Not voting—Ford—1.

BALTIMORE, MD., *June* 28, 1897.

To the Council of the American Pharmaceutical Association:

Your Committee on Finance, after a careful examination of expenditures of the past fiscal year, and taking into consideration the probable necessary outlays for the year 1897–98, offer the following budget of appropriations for your consideration and approval:

Budget of Appropriations for the fiscal year 1897–1898.

Salaries	$2450 00
Proceedings	2500 00
Traveling Expenses	200 00
Stenographer	125 00
Prizes	150 00
Printing and Stationery	450 00
Badges	30 00
Insurance	20 00
Journals for Reporter	50 00
Premium on Treasurer's Bond	25 00
Committee on Membership	25 00
Committee on Transportation	25 00
Section on Commercial Interests	25 00
Section on Education and Legislation	50 00
Section on Scientific Papers	50 00
Miscellaneous Expenses	125 00
*Special Committee on Research	51 82
*Special Com. on Status of Pharm. in U. S. Army and Navy	40 79
	$6392 61

* Unexpended balances of 1896–97 appropriations.

Respectfully submitted, CHARLES E. DOHME, *Chairman.*

POTTSVILLE, PA., *July* 5, 1897.

Dear Sir: Chairman Thompson puts the question, "Shall the Report of the Committee be adopted?"

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Sheppard, Shumpik, Thompson, Watson, Whelpley—18.

Nays—0.

Conditional—Good—1.

Not voting—Ford, Remington—2.

POTTSVILLE, PA., *July* 15, 1897.

Dear Sir: At the request of the Committee in charge of printing the Proceedings of the Seventh International Pharmaceutical Congress, the Chairman of the Council has appointed A. E. Ebert, of Chicago, on said Committee, to assist Oscar Oldberg in the work.

Respectfully yours, GEO. W. KENNEDY, *Secretary of Council.*

This was unanimously agreed to.

POTTSVILLE, PA., *July* 5, 1897.

Dear Sir: E. Shumpik moves the adoption of the following programme, seconded by W. A. Frost:

PROGRAMME.

Tuesday, August 24.	11 a. m.	Council Meeting.
	2:30 to 4 p. m.	First General Session.
	4 to 5:40 p. m.	Sports and games.
	8:30 p. m.	Informal reception and promenade concert.
Wednesday, August 25.	9:30 a. m.	Second General Session.
	2 to 4 p. m.	Commercial Section.
	4 to 5:30 p. m.	Boat ride.
	8:30 p. m.	Travelers' entertainment.
Thursday, August 26.		Trip to Taylor Falls and Dells of St. Croix.
	8:30 p. m.	Lectures by Pres. Cyrus Northrup, of the University of Minnesota, and Prof. F. J. Wulling, Dean of the School of Pharmacy, University of Minnesota.
Friday, August 28.	9:30 a. m.	Scientific Section.
	2 to 4 p. m.	Scientific Section.
	4 to 5:30 p. m.	Base ball game.
	8:30 p. m.	Hop.
Saturday, August 28.		Trip by cars and carriages of the Twin Cities (Minneapolis and St. Paul).
	Evening.	Banquet (?).
Sunday, August 29.		Devoted to rest.
Monday, August 30.	9:30 a. m.	Section on Pharmaceutical Education and Legislation.
	2 p. m.	Section on Pharmaceutical Education and Legislation.
	8:30 p. m.	Section on Pharmaceutical Education and Legislation.
Tuesday, August 31.	9:30 a. m.	Final General Session.

Please send your vote to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of Council.*

A substitute programme with explanatory letter was submitted to members of the Council immediately upon receipt of the preceding, as follows:

POTTSVILLE, PA., *July* 10, 1897.

Dear Sir: A copy of the following letter is sent to each member of Council, which gives reasons why the substitute offered by Chas. Caspari, Jr., should be adopted.

Respectfully yours, GEO. W. KENNEDY, *Secretary of Council.*

BALTIMORE, *July* 6, 1897.

MR. WM. S. THOMPSON, *Chairman of Council.*

Dear Sir: While the draft of programme submitted by the Committee on Arrangements, through the Local Secretary, appears to offer an excellent alternation of work and recreation, I fear it will not meet with approval from all members present at the meeting, some of whom will desire to leave for home on Monday, and others, who will return by the lake route, must leave Lake Minnetonka about 7 a. m. on Tuesday, August 31, in order to reach Duluth in time for the steamer leaving at 1:45 p. m. on that day.

I would therefore move to substitute the enclosed programme for the one submitted by Mr. Shumpik.

As our railroad tickets will be good to leave Lake Minnetonka September 6–9, a social session, as inaugurated last year, could be opened after adjournment of the third general session on Saturday, August 28th, and the subsequent entertainment features incorporated therein. Some members who desire to leave promptly will probably visit Minneapolis and St. Paul on Sunday, and others may be willing to forego the last day's entertainments entirely.

Yours very truly, CHAS. CASPARI, JR., *General Secretary.*

POTTSVILLE, PA., *July* 10, 1897.

Dear Sir: Chas. Caspari, Jr., moves, seconded by Geo. W. Kennedy, that the following programme be substituted for the one submitted by E. Shumpik:

PROGRAMME.

Tuesday, August 24, 1897,	11:00 a. m.	Council Meeting.
	2:30 p. m.	First General Session.
	6:00 p. m.	Meeting of Nominating Committee.
	8:30 p. m.	Reception and Promenade Concert.
Wednesday August 25, 1897,	10:00 a. m.	Second General Session.
	2:30 p. m.	Commercial Section.
	8:30 p. m.	Travelers' Entertainment.
Thursday, August 26, 1897,	10:00 a. m.	Scientific Section.
	2:30 p. m.	Scientific Section.
	8:30 p. m.	Scientific Section.
Friday, August 27, 1897,	10:00 a. m.	Section on Pharmaceutical Education and Legislation.
	2:30 p. m.	Section on Pharmaceutical Education and Legislation.
	8:30 p. m.	Section on Pharmaceutical Education and Legislation.
Saturday, August 28, 1897,	10:00 a. m.	Third General Session. (Final Business Session.)
	4:00 p. m.	Boat Ride.
	8:00 p. m.	Lectures by President Northrup and Prof. F. J. Wulling, of the University of Minnesota.

Sunday, August 29, 1897,	Devoted to Rest.
Monday, August 30, 1897,	Trip to Taylor Falls and Dells of St. Croix.
Tuesday, August 31, 1897,	Trip by cars and carriages of the Twin Cities (Minneapolis and St. Paul). Evening, Banquet.

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Remington, Sheppard, Thompson, Watson, Whelpley—19.

Nays—Ford, Shumpik—2.

POTTSVILLE, PA., *July* 15, 1897.

Dear Sir: It is moved by S. A. D. Sheppard, and seconded by Charles Caspari, Jr., that Dr. H. M. Whelpley be requested to have fifty gold bars made, for use at the next annual meeting.

Please send your vote to the undersigned.

GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Ford, Frost, Good, Gordon, Hallberg, Hechler, Hopp, Kennedy, Morrison, Parisen, Payne, Sheppard, Shumpik, Thompson, Watson, Whelpley—20.

Nays—0.

Not voting—Remington—1.

BALTIMORE, MD., *July* 19, 1897.

To the Council of the American Pharmaceutical Association.

Gentlemen: The Finance Committee of the American Pharmaceutical Association recommends the renewal of the appropriation of $340.00, passed by the Council in 1894, for the purpose of publishing the Proceedings of the Seventh International Pharmaceutical Congress; and to have this sum placed at the disposal of the special committee appointed for that purpose at that time.

Respectfully submitted,

CHARLES E. DOHME,
WILLIAM C. ALPERS,
LEWIS C. HOPP.

POTTSVILLE, PA., *July* 27, 1897.

Dear Sir: It is moved by Geo. W. Kennedy and seconded by W. S. Thompson that the recommendations of the Finance Committee be adopted.

Please send your vote to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Gordon, Hechler, Hopp, Kennedy, Morrison, Parisen, Sheppard, Shumpik, Whelpley—15.

Nays—0.

Not voting—Ford, Hallberg, Payne, Remington, Thompson, Watson—6.

CINCINNATI, O., *February* 8, 1897.

MR. W. S. THOMPSON, *Chairman of the Council, American Pharmaceutical Association, Washington, D. C.*

Dear Sir: I beg to notify you that at the last regular meeting of the Academy of Pharmacy a motion was unanimously adopted, thanking you and the Council of the American Pharmaceutical Association for the kind and prompt attention shown our Committee on Formulas.

Assuring you that the Academy will strive hard to creditably take advantage of the kind permission granted them,

I am, very respectfully yours, FRANK H. FREERICKS.

S. A. D. Sheppard moved, seconded by G. W. Kennedy, that the vote by which the substitute programme was adopted be reconsidered. Agreed to.

S. A. D. Sheppard moved that the printed programme, prepared and submitted by the Local Committee, be adopted.

The motion having been accepted, C. S. N. Hallberg moved to amend the same by adding, after striking out 10 a. m. Friday and 9:30 a. m. Saturday, and inserting 9 a. m in place of the hours named.

The amended programme of the Local Committee was then adopted.

It was moved by S. A. D. Sheppard, seconded by G. W. Kennedy, that the Council urgently request the presiding officers of all sessions to call the meetings together promptly at the hour named for such meetings. Adopted.

W. C. Alpers moved, seconded by J. M. Good, that hereafter the Local Secretary, General Secretary and Secretary of the Council form a committee to draft the programme of the meeting of the Association and submit the same to the Council for approval. Adopted.

On motion of Chas. Caspari, Jr., duly seconded, the Secretary of the Council was directed to call for a report from the committee on publication of the Proceedings of the Seventh International Pharmaceutical Congress.

The report of the Committee on the Ebert Prize was presented and read and, on motion of J. M. Good, duly seconded, the recommendations contained therein were adopted.

On motion of S. A. D. Sheppard, duly seconded by Chas. Caspari, Jr., the names of Joseph W. Eckford and Jacob Jesson were directed to be placed on the list of Life Members, old style, without the Proceedings.

It was moved by S. A. D. Sheppard, and seconded by Jas. M. Good, that, in consideration of the great general depression in the retail drug business throughout the entire country, the following named members, having paid their annual dues regularly for many years, but now being in arrears, be not dropped from the roll for non-payment of dues, but that their dues be remitted and their resignations accepted: Chas. R. Bechmann, Francis M. Bishop, Edwin L. Boggs, Henry J. Brown, Edw. S. Burnham, J. Kellar Burns, John Colgan, Geo. R. Davis, Andrew J. Ditman, Louis Dreher, John S. Drury, Nathan B. Edwards, Constantine B. Elbe, Philip H. Franklin, Oscar W. Geier, Chas. Grandjean, Newton G. Hildreth, Louis C. Hogan, Wm. H. Hyler, Albert O. Ingalls, Daniel T. Macdonald, Geo. L. Marsteller, Arthur F. May, Geo. H. Parker, Delbert E. Pratt, Cyrus Pyle, Joseph Riesenman, Daniel J. Roberts, Chas. H. Scoville, Bond E. Sedberry, Frank L. Slocum, Joseph S. Smith, Chas W. Tobey, Oscar C. Weinman, Duane B Williams, Joseph S. Whall. Adopted.

On motion of S. A. D. Sheppard, seconded by George W. Kennedy, the dues of Frank Harrington, Ashbel H. Merrell, Clark Z. Otis and T. H. Sands Pennington were remitted, and their names continued on the list of members.

Messrs. A. E. Ebert, A. B. Prescott and F. E. Stewart, being present, were extended the privileges of the floor and were heard in behalf of an old ex-member of the Association, Frederick Stearns, of Detroit, Mich.

The following letters were presented by A. E. Ebert:

CHICAGO, *August* 20, 1897.

Dear Mr. Ebert: I have the pleasure to send you a letter received from Mr. Stearns, in reply to one from myself to him, in relation to the proposition made by several of his old friends, to bring about a reinstatement of Mr. Stearns as a member of the A. Ph. A. You will observe he takes a very manly position and one that can hardly fail to create a kind feeling toward him in those who do not know him, and a feeling of respect and confidence in the old friends who know him well.

The many years which have passed since the event of his severance from the A. Ph. A.

have no doubt caused most members to forget the cause of it, and there is little reason for reviving the history of it now; to me it is sufficient that a former member and a gentleman has seen the error of his hasty decision, and is willing to stand upon his more recent record for vindication of his character and motives.

As I cannot be present at the meeting of the A. Ph. A., I would be glad if you will present the matter to the Council for their approval, and trust that our action may be viewed favorably and receive endorsement, to the end that a worthy man may be relieved from the odium which attaches to dismissal from membership, when he confesses and repents of his hasty action of long ago.

Sincerely yours, E. H. SARGENT.

DETROIT, MICH., *August* 13, 1897.

MR. E. H. SARGENT, *Chicago, Ills.*

Dear Sir: Your kind letter of August 7th, in which my feelings and sentiments regarding the action of the American Pharmaceutical Association, in depriving me of membership, as a penalty for the violation of its code of ethics, nearly thirty years ago, and your expression of desire—having been its presiding officer at that time—to take some action now with a view to my reinstatement to fellowship, if possible—comes to me as a pleasant and grateful surprise.

The error for which I have borne the penalty for so many years, would never have been committed in the light of maturer experience and reflection; and I have accepted the verdict of my peers, realizing that it was just, though to me severe.

I have suffered banishment from fellowship with friends and members of the Association for nearly thirty years—depriving myself of their friendship and esteem because I did not take time to consider the far-reaching effects of not bowing to the will of the Association at the time.

This I now sincerely regret; therefore, while I have never asked to be reinstated, and would not urge it now, yet I would gladly receive such treatment from the Association, as would show that my business career since that time justifies it in taking the action you are to propose.

Sincerely yours, FREDERICK STEARNS.

F. E. Stewart presented a power of attorney from Frederick Stearns, authorizing him to perform such acts and to sign such papers as in his opinion may be necessary or advisable, and confirming and ratifying all acts lawfully done as attorney by said F. E. Stewart.

The report of the Committee on Membership was presented by the Secretary. On motion of H. M. Whelpley, duly seconded, the reading of the Report was dispensed with and the same referred to the Association at large.

S. A. D. Sheppard moved, seconded by G. W. Kennedy, that Louis D. Bauer, of Philadelphia, be made a Life Member of the Association upon payment of twenty (20) dollars. Agreed to.

The Treasurer's report was read and on motion referred to the Association.

Chairman Thompson appointed Chas. E. Dohme and Geo. F. Payne a committee on credentials, with instructions to report direct to the Association.

Upon motion Council adjourned.

GEO. W. KENNEDY, *Secretary.*

Upon motion of Dr. Whelpley, seconded by Mr. Main, the minutes of the Council were adopted as read.

The Secretary of the Council, G. W. Kennedy, read the names of eighty-one applicants for membership, which had been referred by Council, and announced that the list would be posted for inspection.

The following gentlemen were appointed by the President as Committee on Time and Place of Next Meeting: Messrs. S. A. D. Sheppard, Chas. E. Dohme, N. A. Kuhn, T. A. Miller and Jos. Jacobs.

The President having announced incidental business as next in order, the Secretary read the following invitations received from the cities of Richmond, Omaha and Galveston, which were, on motion of Mr. Main, seconded by Mr. Kuhn, referred to the Committee on Time and Place of Next Meeting without recommendation.

RICHMOND, VA., *August* 20, 1897.

On behalf of the city of Richmond, I take great pleasure in extending an invitation to the American Pharmaceutical Association to hold their next annual convention in this historical city. Trusting it will be your pleasure meet in our city in 1898, I remain,

Yours truly, RICHARD M. TAYLOR, *Mayor*.

RICHMOND, VA., *August* 19, 1897.

To the President and Members of the American Pharmaceutical Association, Lake Minnetonka, Minn:

Gentlemen: At a called meeting of the Board of Directors of The Richmond Chamber of Commerce, held the 18th instant, a resolution was unanimously adopted extending to your honorable body, on behalf of the Chamber, a hearty invitation to hold its Forty-sixth Annual Meeting in the city of Richmond, Virginia.

In conveying this invitation it is proper to say, that in addition to the very lively feeling of interest which exists on the part of your members resident in Richmond, a feeling of civic pride and hospitality, existing with all organizations and classes in the community, will be highly gratified should your Association honor the city by your presence in 1898. It will then have been just a quarter of a century since your last meeting in Richmond, and it is sincerely believed that the increased facilities for agreeably entertaining and interesting visitors would render your sojourn here a pleasant one in many respects, besides meeting old and making new friends, and justifies the hope that your Association will favorably consider the present invitation.

Should a decision be reached in accordance with its earnest wishes, the Chamber takes great pleasure in tendering its Assembly Hall for the daily sessions of your Association.

Very cordially, THE RICHMOND CHAMBER OF COMMERCE.

S. H. HAWES, *President*.

R. A. DUNLAP, *Secretary*.

HARRISONBURG, VA., *August* 19, 1897.

To the Officers and Members of the American Pharmaceutical Association:

Gentlemen: As President of the Virginia Pharmaceutical Association, it gives me great pleasure to extend to you, in behalf of the Pharmacists of the Old Dominion, a most cordial invitation to hold your next annual meeting in the city of Richmond, Va.

This city, the capital of our State, possesses unusual attractions for visitors. Situated on the historic James, and near the old and celebrated towns of Williamsburg and Jamestown, it is a city filled with sacred memories, and still echoing with the sounds of our country's great civil struggle. Monuments innumerable lift their proud heights to commemorate heroes and events. Institutions of learning attest the progress that is moving through our Southland now; and the people themselves stand with outstretched hands to extend to you that far-famed hospitality for which their city and State are famous.

When New England sounded the alarm in Boston Harbor and called upon the Colonies to rally to the glorious cause of Independence, Virginia responded with a promptness

which left no room for doubt; and sent her legions out under the immortal Washington to write the fullest pages of our national history.

In turn Virginia now appeals through her pharmacists to the Union of American Pharmacists, to confer the pleasure and honor of their presence upon her beloved city, and stands waiting with the half-formed conviction that her invitation will not be declined.

Some years ago Polk Miller, with his artillery, was stationed outside of Richmond, firing hostle missiles straight at many of you, with the firm intention of preventing your entrance into the city that he loved and was protecting. Now he stands with *banjo* strung across his shoulder, outstretched arms and a warm and eager Southern welcome on his lips, anxious to show you all there was to protect, and for which to offer life itself, in our city of Richmond; and behind him is a solid phalanx of welcoming men and women, who will give you of their best.

To you then, as fellow pharmacists, we extend the right hand of good fellowship. Come to us and give us an opportunity to welcome you as Virginia would welcome such an honorable body of staunch American men.

We wish for you a session of the fullest benefit and pleasure. May your labors result in the professional and commercial advancement of all the pharmacists in our great Republic, and may each succeeding year bring the fulfillment of all the promise and success that a Divine Ruler seems in His gracious goodness to hold out for our encouragement.

Cordially and fraternally yours,

JAMES L. AVIS, *President Virginia Pharmaceutieal Association.*

RICHMOND, VA., *August* 21, 1897.

The American Pharmaceutical Association in Convention:

Dear Sirs: The Young Men's Business Association of Richmond, Va., extend their greetings through our Mr. T. A. Miller, and ask your kind consideration of meeting in Richmond, Va., in 1898 next.

HENRY LEE VALENTINE, *Acting President.*

EXECUTIVE CHAMBER, LINCOLN, NEB., *August* 24, 1897.

The American Pharmaceutical Association, in Convention at Minneapolis, Minn:

Greeting: On behalf of the people of the State of Nebraska, I take pleasure in extending to the American Pharmaceutical Association a cordial invitation to hold its next annual meeting in the city of Omaha, Neb. From June to November, in the year 1898, the Trans-Mississippi and International Exposition will be held in the metropolis of Nebraska, and a large number of organizations of various kinds have already signified their intention to hold their 1898 meetings there during the time mentioned. The citizens of Nebraska in general, and of Omaha in particular, will extend every courtesy to the delegates representing your Association, and will leave nothing undone that will in every way make your visit to Omaha in 1898 a pleasant and prosperous one.

Trusting that you may decide to hold your 1898 meeting in the Exposition city of the trans-Mississippi country, and with the hope that your present, as well as all future meetings, may be productive of the utmost good, I am, with expressions of esteem,

Yours very truly, SILAS R. HOLCOMB, *Governor.*

CITY OF OMAHA COUNCIL CHAMBER, OMAHA, NEB., *August* 10, 1897.

The Mayor and City Council of the city of Omaha send greetings to the American Pharmaceutical Association, and extend to the said Association a cordial invitation to hold its annual convention for the year 1898 in the city of Omaha.

Omaha is centrally located, and has unsurpassed railway facilities, standing in the gateway between the east and the west, and excursions may be easily made to Colorado

and the mountain resorts west of us, the Yellowstone National Park, and all the summer resorts of the northwest, the lakes and camping grounds of northern Iowa and Minnesota, thus enabling those attending your convention to take some pleasant outing after attending the convention. Our own State, Nebraska, at this season of the year, is pleasant, and the parks in which our city abounds are delightful.

We offer you freely the hospitality of the city, in which we believe we have ample hotel accommodations and convention halls in which your meetings may be held.

And in addition to all this, and above all this, the Trans-Mississippi and International Exposition will be in progress in the city of Omaha during the summer of 1898, in which all of the States west of the Mississippi river, and many of the eastern States, will display the productions of their fields and forests, their mines and their mills, which we believe will be a means of pleasure and enjoyment to all who may attend.

Trusting that you will accept this invitation, and that we may have the pleasure of entertaining you some time during the summer of 1898, we remain,

Yours very respectfully,

FRANK E. MOORE,
Mayor.
W. W. BINGHAM,
President City Council.
WM. F. BECHEL,
President pro tem.
M. D. KARR,
ERNEST STUHL,
C. O. LOBECK,
LOUIS BURMESTER,
D. T. MOUNT,
FRANK J. BURKLEY,
GEO. W. MERCER.

Attest:
BEECHER HIGBY,
City Clerk.

OMAHA, NEB., *July* 6, 1897.

To the American Pharmaceutical Association, Minnetonka, Minn.:

Greeting: The Commercial Club of this city, by unanimous action, cordially invites your worthy organization to select the city of Omaha, Neb., as the place for holding your next annual meeting for the year 1898.

The membership of this Club is composed of all the business and professional interests of this city of all classes.

Provided you select Omaha for your next meeting place, we will furnish ample accommodations for meetings, also guarantee first-class hotel accommodations at reasonable rates. The Trans-Mississippi and International Exposition will be in operation at that time, which will be second only to the World's Fair, and will be an attractive feature for your meetings. Omaha is the central city of the United States. Twenty lines of railway diverge from Omaha, forming a direct line of road to every city in the country. This city is midway on the shortest transcontinental line between the two oceans. Provided any of your members desire to go farther west, a direct line of road runs from Omaha to all places of interest, including the Black Hills, Yellowstone Park, Colorado, Salt Lake and California.

Again we urge you to come to Omaha in 1898. The freedom of the city is extended to you, and you will be entertained by warm hearts and prodigal hands.

Hoping your meeting in Minnetonka will be attended with success, and extending to you our best wishes, I am

Yours very truly,

J. E. UTT, *Secretary.*

GALVESTON, TEX., *August* 27, 1897.

INGOMAR F. ORTON, *Hotel Lafayette.*

Chamber Commerce, on behalf Galveston citizens, extend through you earnest invitation to American Pharmaceutical Association to hold next meeting here.

C. H. MCMASTERS, *Secretary.*

THE SECRETARY: Mr. President, I think it is proper right here to renew an invitation which should also go to the committee on time and place of meeting, as it has been before this Association for two years. You will probably remember that at Denver, and also at Montreal, the city of Baltimore put in a claim for the 1898 convention, and on behalf of that city, I would like to renew that invitation here very strongly. It has been twenty-seven years since this Association met in Baltimore, and I think the recollections of those who attended the meeting at that time are of such a character that they feel like renewing the visit.

Resolutions from the State Pharmaceutical Associations of Minnesota, New York and Pennsylvania were presented by the Secretary, and on motion of Mr. Ebert, seconded by Mr. Good, referred to the Committee on National Legislation.

A communication from the Proprietary Section of the Wholesale Druggists' Association was read by the Secretary and on motion of Mr. Kuhn, seconded by Mr. Sheppard, referred to the Commercial Section.

A communication from the Chairman of the Committee of the Delegation to visit the American Medical Association, carrying with it a preamble and resolution, which were presented by the committee, was, on motion of Mr. Stewart, seconded by Mr. Sheppard, referred to the Council for consideration.

THE SECRETARY: We have two communications here referring to the appointment of delegates to represent the United States Government at the Eighth International Pharmaceutical Congress; as they have already been acted upon and reported by the President in his annual address, I think it will not be necessary to read them.

We have also a communication signed by fifteen or twenty apothecaries in the United States Navy, which I will read.

To the President of the American Pharmaceutical Association.

Sir: We, the undersigned, apothecaries U. S. Navy, desire to convey through you to the members of the American Pharmaceutical Association, and especially to the Committee on Status of Pharmacists in the Government Service, our appreciation of the energetic work which has been done in behalf of the military pharmacist.

Much has been accomplished under the admirable conducting of the campaign by their chairman, and the committee are to be congratulated that their efforts have placed the bills in a seemingly most favorable position for successful legislation at the next session of Congress.

We believe the continued interest of the Association is essential to the ultimate success of legislation in our behalf, and express our desire that the Committee on Status of Military Pharmacists be re-appointed, and ask for a continuance of the interest of the members of the Association as a whole.

With much esteem and recognition of our obligations to the American Pharmaceutical Association.

W. H. HUNTINGTON,
M. D. BAKER,
C. O. LEARY,
JOHN W. WOOD,
HENRY BUDENBORN,
GEO. H. KLOCK,
EDGAR MUMMA,
NORMAN I. MCLEAN,
JOSEPH MCKEE,
V. M. JOHNSON,
EDWIN S. MORSE,
FRED'K W. BRECK,
JOSEPH H. GRAHAM,
FRANK R. GRAHAM,
CHAS. E. REYNOLDS,
WM. H. MYERS,
S. G. LOUIS,
W. J. WILLIAMS,
JOSEPH MCMAHON,
JOHN COWAN.

On motion of Mr. Hallberg, seconded by Mr. Whelpley, it was voted to accept the communication and the suggestions contained therein.

MR. WHEPLEY: Mr. President, the occupation of the druggist is such that he devotes much of his time to weighing and measuring, so it is not surprising that the A. Ph. A. should have devoted some of its time to the discussion on weights and measures during the first meetings held by this organization, and I find that just forty years ago the subject of adopting a metric system was brought up for discussion, and from that year to the present time the American Pharmaceutical Association has been what might be considered a staunch friend of the metric system. Now we often hear from members who do not attend the Association, that the Amer. Pharm. Assoc. has passed many resolutions which are to be tendered to other organizations and to individuals. I have a resolution not to be tendered to any one outside of our own ranks. It reads as follows:

"Recognizing the convenience and scientific importance of the metric system of weights and measures, we, the members of the American Pharmaceutical Association, in forty-fifth annual convention assembled, unanimously adopt the same as the official system of weights and measures for this organization.

"*Resolved*, That the members of this Association be requested to make use of the metric system in designating weights and measures, in papers, reports, and communications presented to this organization.

"That the officers and committees be requested to employ the denominations of the metric system whenever weights and measures are mentioned in their circulars or reports."

MR. OLDBERG: I move the adoption of that report.

MR. HALLBERG: I second the motion, and desire to say that there are a number of state associations who have passed similar resolutions in the last few years.

MR. WHELPLEY: I would say that all officers and committees are requested to use the system. It is not obligatory, but it is requested.

MR. RYAN: Mr. President, I would say that a resolution of the same kind has been passed by the American Medical Association, and you will find it in their rules that such a request is made, that all the papers and other matters that come before the association shall be in the metric system. It is not a demand at all, it is simply a request, but it is a fact that many papers do appear in the old system. They took that stand a number of years ago.

The motion was put and carried.

On motion, which was duly seconded, the meeting adjourned until ten o'clock Wednesday morning.

SECOND SESSION, WEDNESDAY, AUGUST 25, 1897.

The Second General Session of the Association was called to order by President Morrison, at 10:30 a. m.

The minutes of the First Session were read by the Secretary, and on motion of Mr. Diehl, seconded by Mr. Dohme, adopted as read.

The minutes of the Council having been called for, they were read by the Secretary of the Council, G. W. Kennedy, as follows, and on motion of Mr. Eliel, seconded by Mr. Dohme, adopted as read:

SIXTH SESSION OF THE COUNCIL, AUGUST 25, 1897.

Council convened at 9.30 a. m., at the Hotel Lafayette, Chairman W. S. Thompson presiding. The following members were present: Messrs. Alpers, Caspari, Diehl, Dohme, Frost, Good, Hallberg, Kennedy, Payne and Sheppard.

On motion of S. A. D. Sheppard, the reading of the minutes of the last session was dispensed with.

The Committee on Membership through its secretary presented the names of twenty-two (22) applicants for membership. On motion the applications were directed to take the usual course.

The following resolution, offered by J. M. Good and seconded by H. M. Whelpley, was adopted unanimously:

Resolved, That we gladly accept from Mr. Frederick Stearns, of Detroit, his frank acknowledgment of his error, as stated in his letter to E. H. Sargent, of Chicago, and submitted to us by Dr. F. E. Stewart, his attorney, and A. E. Ebert, and direct the same to be placed on the records of the Association. And we further state that in the judgment of the Council there is now nothing to debar him from making application for membership in the Association.

The secretary of the Committee on Publication of the Proceedings of the Seventh International Pharmaceutical Congress submitted the following report, which was on motion of G. W. Kennedy, duly seconded, received and referred to the Association.

CHICAGO, *August* 21, 1897.

To the Council of the American Pharmaceutical Association: Your Committee appointed to provide for the publication of the Proceedings of the Seventh International Pharmaceutical Congress, begs leave to report that the said proceedings have been published, one thousand copies being printed. Of these, one hundred copies were sent to Prof. Joseph P. Remington, one of the delegates of the United States in attendance at the Eighth International Pharmaceutical Congress, to enable him to place it in the hands of the members of that Congress. One hundred copies were retained by the Secretary of the Seventh International Pharmaceutical Congress for distribution to foreign members and other foreign pharmacists who sent papers, letters and documents to the Congress, and to the officers and committees having charge of the arrangements for the Seventh Congress. Four hundred copies were sent to the General Secretary of this Association at Baltimore, and four hundred to the same officer at this meeting. The total cost of the report referred to was $327.85. In order to bring the cost within the sum available for that purpose it was necessary to condense the proceedings very materially.

The transactions are printed in English, but all resolutions and formal declarations of the Congress are printed also in French and German,

The papers presented are printed in the original languages of the respective writers, with free English translations.

Respectfully submitted, OSCAR OLDBERG, *for the Committee.*

The following motion, relative to the sale of the pubiished report of the Proceedings of the Seventh International Pharmaceutical Congress, was adopted:

The committee on Publication of the Proceedings of the Seventh International Pharmaceutical Congress having completed the task assigned them and the books being now ready for delivery, it is moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that the price at which the book is to be sold to members of the American Pharmaceutical Association, or any one else desiring to purchase the same, shall be fixed at fifty (50) cents per copy, and that the General Secretary be directed to dispose of them at the above price to any one making demand therefor.

On motion of S. A. D. Sheppard, Council adjourned.

GEO. W. KENNEDY, *Secretary.*

The Secretary of Council having presented the names of twenty-two (22) applicants for membership, was directed to post the same in accordance with the rules, and also to invite the gentlemen whose names were presented at the first general session to complete their membership.

The President called for the report of the Nominating Committee, and the secretary, Dr. Geo. F. Payne, submitted the following recommendations on behalf of the committee:

For President—Henry M. Whitney, Lawrence, Mass.

For First Vice-President—Geo. C. Bartells, Camp Point, Ill.

For Second Vice-President—W. S. Thompson, Washington, D. C.

For Third Vice-President—Jacob A. Miller, Harrisburg, Pa.

For Treasurer—S. A. D. Sheppard, Boston, Mass.

For General Secretary—Chas. Caspari, Jr., Baltimore, Md.

For Reporter on the Progress of Pharmacy—C. Lewis Diehl, Louisville, Ky.

For Members of Council—Wm. A. Frost, St. Paul, Minn.; C. A. Mayo, New York, N. Y.; George F. Payne, Atlanta, Ga.

MR. W. H. TORBERT: Mr. President, on behalf of the western members of this Association I will say that we rejoice that Mr. Whitney has been nominated by your committee to be President of this Association, and I wish to congratulate this Association upon this eminently wise selection, and, therefore, I move the adoption of this report, if that be in order.

The motion was seconded and prevailed.

MR. EBERT: The next thing in order is the election of President; we always elect him by ballot.

On motion by Mr. Good, seconded by Mr. Dohme, the Secretary was authorized to cast one ballot for H. M. Whitney, of Lawrence, Mass., for President.

THE PRESIDENT: The Secretary having cast a ballot for H. M. Whitney for President of this Association, I hereby declare him duly elected. (Applause.)

Upon motion of Mr. Sloan, seconded by Mr. Hallberg, the Secretary was directed to cast an affirmative ballot for Geo. C. Bartells as First Vice-President of the Association, which duty having been performed, the President declared him elected. (Applause.)

Upon motion of Mr. Sayre, seconded by Mr. Sander, the Secretary was directed to cast an affirmative ballot for W. S. Thompson as Second Vice-President, which duty having been performed, the President declared him elected. (Applause.)

Upon motion of Mr. Thompson, duly seconded, the Secretary was directed to cast the ballot of the Association for the remainder of the nominees, which duty being performed, the President declared all the gentlemen proposed by the Nominating Committee elected to the respective offices. (Applause.)

THE PRESIDENT: The next in order is the report of the Finance Committee.

MR. DOHME: The Finance Committee has nothing to report that is not embraced in the report of the Treasurer of the Association. We have no special recommendations to make. The prospects, we think, are fair for a decided betterment of the finances with the boom that is going over the country.

The following report was received and read by the Secretary and, upon motion, accepted:

The Committee on Credentials appointed by the Council beg leave to report that they have performed the duty assigned them and find delegates accredited to this meeting from fifty-four organizations, as follows:

Colleges of Pharmacy—Chicago, Cincinnati, Cleveland, Louisville, Maryland, Massachusetts, National, New York, Philadelphia, Pittsburg, St. Louis—11.

State Pharmaceutical Associations—Alabama, Colorado, Connecticut, Illinois, Indiana. Indian Territory, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Province of Manitoba, Province of Quebec, Rhode Island, South Dakota, Tennessee, Texas, Virginia—31.

Alumni Associations of Colleges of Pharmacy—Philadelphia, St. Louis—2.

Schools of Pharmacy—Purdue University, Northwestern University, University of Michigan, University of Minnesota.—4.

National Associations—American Medical Association, The Proprietary Association, Wholesale Druggists' Association—3.

Local Associations—Academy of Pharmacy of Cincinnati, O.; Kings County, N. Y., Pharmaceutical Association; New York German Apothecaries' Union—3.

Respectfully submitted,

CHAS. E. DOHME,
GEORGE F. PAYNE.

The report of the Committee on Membership having been called for, Mr. G. W. Kennedy, Secretary of the Committee, submitted the following report:

REPORT OF COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

Gentlemen: In carrying out the requirements of our organization as Secretary of the Committee on Membership, I herewith present my twenty-third annual report. Immediately after adjournment of the Forty-Fourth Annual Meeting, held in Montreal, Canada, last year (1896), your Secretary gave the duties of his office prompt attention, by mailing the customary invitation to each applicant who was invited by the Association to complete his membership by signing the regular blank form of completion of membership which was sent at the same time. One hundred and fourteen gentlemen were recommended as eligible to become members of our Association in accordance with the By-Laws; of this number ninety-one (91), about eighty per cent. of those proposed and invited to perfect their membership, have complied, and their names are now on the roll as active members. The percentage of those who were proposed and invited to become members, and who finally completed their membership, is much larger this year than last, and is a little above the average of former years.

The new members represent nearly all sections of our country; they are credited to twenty-eight (28) States, the District of Columbia, Canada, East Africa and Paris, France. Every State and Territory is now represented by membership in our Association. Since the Proceedings for 1896 have been published, the following gentlemen, whose names do not appear on the rolls, have completed their membership: Robert A. Brown, Florence, South Carolina; Alfred Meyer, Paris, France; Frederick Joerger, Brunswick, Ga.

The Treasurer, S. A. D. Sheppard, has reported to your Secretary that on July 1, 1897, two hundred and forty-one (241) delinquents were liable to be dropped from the rolls. This is a very large number, being an increase of thirty-two over the number reported last year, when I made a statement that the number reported then was the largest since I have filled the office of Secretary. To some extent this can be accounted for, owing to the depressed condition in financial matters and the small profits realized from sales in their business; there is still another reason, and one which I have referred to in former reports and to which I call the attention of the Association once more, and that is the necessity of being more careful as to the class of pharmacists who become members. In our desire to show a large increase in membership, many gentlemen are proposed and elected who take little if any interest in our work, and consequently in a short time become indifferent, and either resign or allow themselves to be dropped as delinquents. This element in years gone by has put the Association to considerable expense, and as far as possible should be stopped. In looking over my books, I find that of those who became members since 1890, 113 have been dropped and 61 resigned.

The special auxiliary committee appointed by the President and the Standing Committee on Membership have been at work during the year procuring desirable members. What the result of their labors will be I am unable at this time to say, but the indications are favorable to a good increase. I would certainly be derelict of duty were I not to call the attention of the Association to the excellent work performed by W. H. Huntington, apothecary of the United States Navy and a member of our Association, who evidently has labored indefatigably in a new field during the past year with the apothecaries of the Army, Navy and Marine Service, with a view of obtaining desirable additions to our roll of members. Thus far I have received the papers of 41 and all of them are endorsed by W. H. Huntington; besides they have all paid the annual fee of five dollars in advance. This action of our co-laborer is commendable and should be an example to many others who are interested in the welfare of our organization; besides they show an appreciation of our work towards procuring legislation, which we all know is badly needed to give them proper recognition.

Report of Membership.

Active or contributing members in good standing at last report	1,448	
Members elected since last report	91	
Total		1,539

Loss in Membership (active).

By resignation	35	
By transfer to life membership	13	
By death	30	
Dropped from roll for various causes	67	
Total loss		145
Number on the roll at this report		1,394

Life Membership.

Number on the roll at last report	95	
Number added since last report	13	
Total	108	

Loss in Life Membership.

By death	6	
Number on the roll at this report		102

Honorary Membership.

Number on the roll at last report	15	
No additions		
Loss by death	2	
On roll at this report		13

Total Membership.

Active or contributing members	1,394
Life members	102
Honorary members	13
Total	1,509

I should have been gratified could I have closed this report by the omission of the paragraph which I am now called upon to pen. In the natural order of events I could not have hoped to escape the sad duty of recording the visitation of

> "Him that reaps and layeth low
> Despite what man may say or do."

But, instead of immunity from this sad duty, the mortuary record is the largest that I have yet been called upon to report. Thus we are admonished that there is no escape from "the pale horse and his rider," and that he is sure to overtake some of us during the coming year. Much we will miss the departed both in our meeetings and in the work of our Association, for their devotion and faithful attention to duty proved that their hearts were with us in laboring for the success of our organization.

The names of the departed are:

Matthew F. Ash, Jackson, Miss.
Edson S. Bastin, Philadelphia, Pa.
Samuel J. Bendiner, New York.
Augustus S. Blackman, New York.
Hans M. G. Blestrem, Eau Claire, Wis.
Robt. J. Brown, Leavenworth, Kan.
James Christie, New York.
Jno. B. Farlow, Salt Lake City, Utah.
Chas. K. Gallagher, Washington, N. C.
Albert R. Griffith, New York.
Chas. C. Habliston, Baltimore, Md.
Dr. H. H. J. Hager, Frankfort, Germany.
Wm. E. Halleck, Washington, D. C.
Robert O. Hattenhauer, La Salle, Ill.
Gustavus Holzhauer, Newport, Ky.
Conrad S. Ihlefeld, New York.
Eugene Lalmant, New Orleans, La.
Louis C. A. Last, Moberly, Mo.
Geo. F. H. Markoe, Boston, Mass.
Alfred H. Mason, New York.
Charles W. Riley, Philadelphia, Pa.
Alonzo Robbins, Philadelphia, Pa.
Eliza Rudolf, New Orleans, La.
Louis Sautter, Albany, N. Y.
Geo. F. Schacht, Bristol, Eng.
Louis W. Sherwood, Columbus, Ohio.
Henry Shriver, Cumberland, Md.
Charles A. Sleuman, Jr., Boston, Mass.
Louis F. Stoff, New York.
Julius E. F. Tanke, Chicago, Ill.
Thomas L. Turner, N. Weymouth, Mass.
Thomas McAleer Wehrly, Washington, D. C.
Wm. H. White, Meridian, Miss.
Frederick Wilcox, Waterbury, Conn.
J. Henry Zeilin, Philadelphia, Pa.

Matthew F. Ash, of Jackson, Miss., a life member and one of the oldest members of our Association, died of Bright's disease, November 4th, 1893. He was patient and uncomplaining during his months of suffering; his death was quiet and peaceful; he had no fear of death and was prepared to meet his Creator. He was a man highly respected and esteemed, always ready to feed the hungry and clothe the naked, never turned any one away from his home when appealed to for charity without giving them something. He was one of the best-known druggists in Mississippi, and very much devoted to his profession. He made a number of experiments and labored indefatigably to elevate the pharmaceutical profession. A widow and six children survive him, four sons and two daughters; his affection for them and friends was deep and strong. In all duties and obligations of life he was strict, just, prompt, and would wrong no man, for he was scrupulously honorable. Deceased became a member of our Association in 1856, at the meeting held in the city of Baltimore, Md.

Edson S. Bastin, of Philadelphia, Pa., died April 6th, 1897. He was born of American parents in Wisconsin, in 1843. During the summer he worked on a farm, and in the winter months attended a district school until about fifteen years old, when he commenced attendance on college at Waukesha. When fairly started in a classical course the war broke out and he enlisted. In 1865 he went to the University of Chicago to complete the course of study begun before the war, and was graduated in 1867. He then entered a drug store in the outskirts of Chicago, where he remained for nearly three years, becoming in the mean time much interested in botany, which he studied assiduously during his leisure hours. Just after the great Chicago fire, he sold his store and soon afterward accepted a position as teacher. In March, 1874, he accepted the position of Registrar in the University of Chicago, and later was given charge of a class in botany. About two years later he was appointed professor of geology and botany in that institution, a position which he retained until 1883, in which year he resigned. In 1887 he became the lecturer on botany in the Chicago College of Pharmacy. Besides botany, he conducted the chemical laboratory for a while, and was then given the chair of Botany and Materia Medica, and when a microscopical laboratory was started was placed in charge of that also. He remained with this college until the close of the school year of 1890. In the autumn of the same year he became connected with the Northwestern University School of Pharmacy, in charge of the department of botany

and pharmacognosy, lecturing besides on human physiology. He had just completed and arranged a very complete laboratory for work in botany and microscopy, when an invitation came to take charge of the department of Botany and Materia Medica in the Philadelphia College of Pharmacy, upon the work of which he entered November 1, 1893. Besides various articles published in different pharmaceutical and other scientific journals relating to Botany and Materia Medica, Prof. Bastin was the author of several text-books—Bastin's College Botany, Bastin's Elements of Botany, and Bastin's Vegetable Histology. The first is used in many of the colleges of pharmacy and in many other schools of the country; the second is written for high schools, and has been well received. Besides these he wrote the Botany and Materia Medica lectures for the National Institute of Pharmacy, and also part of the pharmacy lectures and those on chemical physics for that course. Besides his work as a teacher, on which he has always laid great stress, holding that the first duty of a teacher is to teach, his most important work has been in the study of the microscopic structure of drugs. A very able article by deceased on the starches of root drugs appeared in the Pharmaceutical Record for September, 1893, and another on the starches of subterraneous stem drugs is printed in the issue for October, 1893. Deceased became a member of our organization in 1895, at the meeting held in Denver, Colo.

Samuel J. Bendiner, after a lingering illness of nearly three years, died in New York city February 20, 1897, at the age of fifty-nine years. Mr. Bendiner was born at Budapest, Hungary, April 30, 1838, and received his eariy education in his native land. After being graduated by the University of Vienna he came to America, and while yet a young man became the proprietor of a pharmacy at the corner of Third and Amity streets. Some twenty years ago he purchased a store at the corner of Third avenue and Tenth street, afterward disposing of the Third street store and giving his entire attention to the new purchase until the time his health failed. The deceased was an active member of the New York College of Pharmacy and of the German Apothecaries' Society, and it was through his efforts that the conference was held between these two organizations and the Kings County Pharmaceutical Society, which resulted in the compilation of the New York and Brooklyn Formulary of Unofficial Preparations. Mr. Bendiner represented the college on the joint committee of fifteen, and was one of the five who constituted the editing committee. This work was published in 1884, and a second edition followed. The Formulary was offered to and accepted by this Association at the meeting held in Pittsburg in 1885, the offer being made by Mr. Bendiner for the committee; he was continued on the committee and the Formulary was made a national affair. The deceased can therefore be justly called the "father of the National Formulary." Deceased was a trustee of the New York College of Pharmacy and did important work on various committees, his services on the examination committee being especially valuable. He was Vice-President of the College when he was taken sick. He was a member of the New York State Pharmaceutical Association, in the deliberations of which body he took an active part. In business the deceased took a high stand, and the young men who served under him were always taught pharmacy in its best form, and many men who own their own stores to-day date the beginning of their success from the time when they began to follow his precepts. In private life Mr. Bendiner was urbane in manner and fond of company. He had musical and literary taste and talent of no mean order. He was a member of the Liederkranz, and his violin playing was a source of enjoyment both to himself and friends, as were also his humorous prose and poetical productions. Deceased became a member of our Association in 1882 at the meeting held at Niagara Falls, N. Y.

Augustus S. Blackman, the subject of this necessarily brief sketch, was born in Le Raysville, February 10, 1872, and died at the home of his parents in Lestershire, N. Y., Tuesday morning, November 10, 1896. He was an exceptionally bright boy of quick

perception, and at school learned with unusual facility, which even then gave promise of a bright future. He was courteous and made friends wherever he made acquaintances, and possessed the faculty of retaining them ever afterward. He decided to learn the drug business and attended the Philadelphia College of Pharmacy, graduating with honors almost at the head of his class. After his graduation he remained in the drug business and entered the store of his father in Le Raysville for a short time. Later on he secured a position in Wilkesbarre, where the practical education obtained in Philadelphia gave him personal advancement, and he was known as one of the most accomplished apothecaries in the Wyoming Valley. After a time in Wilkesbarre, a more lucrative and responsible position was tendered him in New York City, and he passed three years in charge of a large drug-house there. For two years he had been in business for himself on Long Island, where by his prompt attention to business, courteous manners and genial disposition, he built up a thriving business and made many friends. He possessed unwavering integrity which was never questioned, and many sterling traits of character, which he leaves as a rich legacy to his parents, relatives and friends. All that loving hands and skilled physicians could do was futile to stay the Grim Messenger; and while in the morning of life, before it was yet noon, he calmly and peacefully passed into the "Land of Shadows," behind whose impenetrable veil are hidden the secrets of the Great Beyond, and we can but cherish the hope, "that he but wrapped the drapery of his couch around him and laid down to pleasant dreams," where the sorrows and cares of life cannot enter. His membership in our organization dates back from the meeting held in the city of Chicago in 1893.

Hans M. G. Blestrem died at Los Angeles, California, April 14th, 1897, of consumption. Mr. Blestrem left Eau Claire, where he had been in the employ of Mr. Playtin, in December last, in hopes that the change of climate would prove beneficial, but he failed steadily from the time he left. Deceased was born in Norway in 1866, coming to Eau Claire in 1883; since that time he has clerked for a number of prominent pharmacists. Mr. Blestrem was a student and a good worker. In 1887 he received his assistant's certificate, and in 1889 became a registered pharmacist. He was an active and enthusiastic worker in the Wisconsin State Pharmaceutical Association, of which he was a member almost since its organization. His death will be mourned by a large number of friends, for he won the love and respect of all with whom he came in contact; ever courteous and obliging, industrious and attentive to every detail of his chosen profession, he gained for himself a most enviable reputation. His remains were taken to Eau Claire, where he was buried April 25th. He became a member of our Association in 1889, at San Francisco, Cal.

Dr. Robert J. Brown died in Leavenworth, Kansas, August 19th, 1897, of diabetes. He was born in Beaver Co., Pa., in 1834, and was, therefore, in his 64th year at the time of his death. Deceased had been a resident of Leavenworth since 1857, having removed from Pittsburg, Pa., and at once entered Park's Drug Store, which was then located on Main St. In 1841 he formed a partnership with his brother, Pearson Brown, and opened a store on Shawnee street, later moving to 5th and Shawnee, into the present Hunt building. During the year 1876, he organized the Brown Medical Company, which at one time did a very extensive business. After his arrival in Leavenworth he took a prominent part in the Free State movement, and always identified himself with any movement tending to advance the welfare of his fellows. He was a prominent member of many medical and pharmaceutical, as well as scientific, societies. Dr. Brown was married in 1864 to Miss Emily H. Buck, of Bridgeton, N. J. She now survives him. Two children also survive. Deceased became a member of this Association in 1862, at the meeting held in the city of Philadelphia.

James Christie, of New York, well known throughout the west as the representative of Fairchild Brothers & Foster, died of typhoid fever in St. Luke's Hospital, Duluth,

Minn., on September 17, 1896. He was a native of Owen Sound, Ont., where his parents reside and where he had just been spending his vacation. He learned the drug business with Parker & Co., of that place, graduating from the Ontario College of Pharmacy in 1881. He spent two years in a Medford drug store and then went to New York, where he was engaged for a short time with Caswell, Massey & Co. He had been in the employ of Fairchild and had made many friends in medical and drug circles. His headquarters were in Chicago and he usually had three or four men working for him under his direction. He was unmarried. The body was taken to Owen Sound, Ont., where the funeral was held the 19th. Mr. Christie was a man of unusual business talents, joined with rare social powers. The Mississippi Valley Medical Association was in session at St. Paul when Mr. Christie's death occurred, and the following day adopted resolutions of regret. Similar resolutions were adopted by pharmacists and others representing commercial interests the same day. Mr. Christie became a member of our Association at Chicago in 1893.

E. Waldo Cutler, of Boston, died of cancer at his home in Waltham, Mass. He was born seventy years ago at Ashburnham, and at the age of twenty secured a position with the firm of Lowe & Reed, of Boston, the senior member of which was his uncle. In 1852 he and his brother, George, were admitted to partnership, as another brother, William J., had been before that, the firm becoming Reed, Cutler & Company. In the early '70's the firm became Cutler Brothers & Company, the name it still retains. Mr. Cutler was married in 1853 to Miss C. M. Henderson, of Boston, who, with three sons and two daughters, survives him. He was identified with the Swedenborgian movement in Boston. He was trustee of the Massachusetts College of Pharmacy and president of the Boston Druggists' Association. In 1887 he was chosen president of the National Wholesale Druggists' Association and served most acceptably. Deceased was a life member of our Association, his membership dating from 1859, at the meeting held in Boston.

John B. Farlow died at his home in Salt Lake City, Utah, December last, 1896. His age was forty-two years. He was born in Milton, Ontario, and after attending the high school of his native place, he entered the Ontario College of Pharmacy, from which he graduated in 1877. In 1879 he went to Salt Lake City and entered the employ of Godbe, Pitts & Co. as prescription clerk. In 1885, when this company was incorporated, Mr. Farlow was elected vice-president and secretary of the company, a position he held until December, 1891, when he retired, and opened the store which he since conducted in the McCormick Building. Deceased was considered an excellent pharmacist and spent considerable of his time in promoting the profession of his choice. He was president of the Utah Board of Pharmacy, and first president of the Utah Pharmaceutical Association. Resolutions of respect were passed by the Salt Lake Druggists' Association. He was married and his widow survives him. Mr. Farlow became a member of our Association at the meeting held in San Francisco, Cal., in 1889.

Charles K. Gallagher, a life member of our Association, died at his home, Washington, N. C. Deceased, after receiving a good education, decided to study the drug and chemical business by entering a retail pharmacy, where he remained for a number of years, after which he went into business for himself and was quite successful, owing to the fact that he was very attentive to business and dispensed the best drugs to be had. He was highly respected and esteemed in the community in which he resided. He was one of the oldest members of our Association, having joined in 1857, at the meeting in Philadelphia, Pa.

Albert R. Griffith, the senior member of the firm of Griffith & Co., retail druggists at 63 and 2241 Third avenue, New York, died at his residence in that city, Wednesday, April 7th, 1897. The deceased was formerly in business in Oil City, Pa. He went to New York about twelve years ago and opened a pharmacy at 2241 Third avenue, and later purchased a second establishment at 63 Third avenue, and continued in the active

management of these places of business, as well as to partially supervise the Oil City store, in which he was interested. Mr. Griffith spent his time between the city of New York and Oil City, though giving the greater portion of his attention to his larger interests in New York. Deceased was born at Warren, Pa., was fifty-six years of age and unmarried. He became a member of our Association in 1870, at the meeting in Baltimore, and subsequently was made a life member.

Charles C. Habliston, of Baltimore, Md., died November 10th, 1896. By his death Baltimore lost one of its best known druggists. During more than a quarter of a century he had been a familiar figure in the pharmacy at the northeast corner of Baltimore and Gay streets. He entered it when a boy as apprentice under the proprietorship of Adam J. Gosman. In due time he was graduated from the Maryland College of Pharmacy, and eventually became the owner of the store which he has ever since conducted with much success. He was competent and had a reputation for conscientiousness. His demise therefore, at the early age of forty-six, has caused general regret among those who knew him and the profession which he so well represented. Short of stature and slight of physique, with a rather nervous temperament, he was not very strong. The immediate cause of his death was apoplexy. Mr. Habliston leaves a widow and four children. He became a member of our Association in 1894, at Asheville, N. C.

Hans Hermann Julius Hager, an honorary member of our Association, died at his home at New Ruppin, Germany, aged 81 years. Dr. Hager was born at Berlin, January 3, 1816, and, in spite of his poverty, became one of the most widely-known, perhaps the most widely-known, of the pharmaceutical writers of the century. At the age of 16, he left school and began his pharmaceutical apprenticeship at the town of Salzwedel. At the expiration of nine years he was able to pass the state examinations at Berlin without having taken the university course, which is usually a prerequisite to these examinations, for, during his apprenticeship, he had found time for much study and had already commenced his brilliant career as a writer. In 1843, Dr. Hager, or plain Herr Hager, as he was then, purchased a store at Fraustadt, to which he devoted his labors for 17 years, not so constantly, however, that he was not able to give much attention to his literary work. Finding, however, that he could not serve both masters, he gave up the store at the end of the period named and went to Berlin, where opportunities for original investigations and writing were better. It was at this time that he became Dr. Hager; the philosophical faculty of the University of Jena conferring upon him the degree of Doctor of Philosophy, while the medical faculty added the honorary degree of Doctor of Medicine. Hager's Handbuch der Pharmaceutischen Praxis is a book which has, no doubt, had as large a circulation as any similar work ever published in Europe; it being to the German apothecary what our dispensatories are to us, even more in some respects, and its use is by no means confined to Germany. Dr. Hager founded and, for 20 years, edited the Pharmaceutische Centralhalle, and also for many years was associated with Jacobsen as editor of the Industrie Blätter. Dr. Hager was also the author of a work on the Technique of Dispensing, to give its English title, and of a Pharmaceutical Manual, as well as of First Lessons in Pharmacy, Introduction to the Artificial Manufacture of Mineral Waters, The Microscope and Its Use, a Latin-German Pharmaceutical Dictionary, and many other works on subjects allied to pharmaceutical chemistry. Like Agassiz, Dr. Hager had no time for the acquirement of riches, and he died poor as he was born. The legacy he left to the world, however, is more valuable than gold, and will prove more enduring than castles. Deceased was elected an honorary member in 1868.

Robert C. Hattenhauer, Jr., of La Salle, Ills., died suddenly April 30, 1897. He was the only son of R. C. Hattenhauer, one of the most prominent druggists of La Salle. Mr. Hattenhauer was president of the Illinois Pharmaceutical Association. The deceased was a very popular young man, and was in his father's store for some years. He was honest and perfectly reliable in all his business transactions. He leaves his parents, a wife

and two children, to mourn his death. Deceased became a member of our Association in 1881, at Kansas City, Mo.

William E. Halleck. Born in Washington, D. C., October 19, 1852. Died June 23, 1897, of valvular disease of the heart, after an illness of three months. He was educated at the public schools in his native city. In 1868 he began to learn the drug business with Wm. Thomas, at the corner of 3d and I streets, N. W., with whom he remained until 1872, after which he clerked for Wm. P. Stone, at the corner of 7th and O streets, N. W., where he remained until he engaged in business on his own account in 1877, at the corner of 5th and H streets, N. W. Several years ago Mr. Halleck built quite a fine store and dwelling on the corner opposite his first place, and here he continued in business until his death. He was known among his acquaintances as a kind, charitably disposed man. He confined himself very closely to his business. In 1878 deceased married Miss Stone, the sister of his former employer. He leaves a widow, no children. He became a member of our Association in 1890 at the meeting held at old Point Comfort, Va.

Gustavus Holzhauer, of Newport, Ky., died there November 23, 1895. Mr. Holzhauer was born in Würtemberg, Germany, in 1847. He emigrated to America in 1866, arriving in New York city. From there he went to Madison, Ind., and through relatives secured a position to learn the apothecary business, taking lessons in the evenings studying the English language. Being a close student and very much attached to his business, he naturally made a success of it. After spending several years in Madison he accepted a more lucrative position with Merriam & Co., Cincinnati, corner of Fourth and Main streets. From there he went to Newport, Ky., and engaged himself with Mr. Yungblutt, until 1872; shortly after he began business for himself, and by hard labor and close attention to business was very successful. He held several positions of trust, was a director of the Newport National Bank, a director of the fire insurance company of Covington, Ky. In 1872 he was married to Miss Amalia Kanther, who, with three daughters and one son, are left to mourn their loss; the son is managing his father's business. In 1893, at the meeting held in Chicago, deceased became a member of our Association.

Conrad S. Ihlefeld, of New York, died there in 1895. He was born and educated as pharmacist in Gelnhausen, Germany, and graduated as apothecary from the University of Marburg. In 1864 he emigrated to this country. In 1866 he conducted a drug store on Eighth avenue, between Forty-fourth and Forty-fifth streets. In 1875 he, with his brother, John, started a large store corner Forty-fifth street and Eighth avenue. The two brothers later on separated, and Conrad kept the store until he died. Deceased being a skilled apothecary, having received an excellent education, and attentive to business he made considerable money. He is spoken of very highly by all that became acquainted with him as an honest and fair-dealing man. Mr. Ihlefeld became a member of our Association in 1881, at Kansas City, Mo.

Eugene Lalmant, one of the most popular men of New Orleans, La., died at his residence, November 21, 1896. He was a native of that city, and spent nearly his entire life in the drug business. He was connected with a great many organizations, and at one time was a member of twenty-one charitable organizations. How well he was regarded and esteemed by his associates is attested by his having filled the presiding officer's chair in nearly all of the associations with which he was connected. Mr. Lalmant was born in New Orleans in 1830. His father was a druggist, and had means to give his son a good education. After graduating from the high school he took a course in the pharmaceutical school connected with Mercier Hospital. In 1860 he opened a drug store at the corner of Gasquet and Claiborne streets, and remained there until his death. His death will be a great loss to the Louisiana Pharmaceutical Association, in which he was a most active worker and an efficient officer, having been for many years its treas-

urer. Mr. Lalmant leaves a widow and five children. Deceased became a member of our organization at the meeting held in New Orleans, La., in 1891.

Louis C. A. Last, of Moberly, Mo., died there. Deceased was born in Hessville, Ind., in 1867, and removed to Missouri when a small boy with his father and mother, the latter having died since he was in business for himself, and settled in Macon county. In 1881 he moved to Moberly, and since that time has been identified with the drug business. In 1886, 1887 and 1888, Mr. Last, having formerly chosen the drug business as a profession, attended the St. Louis College of Pharmany to prepare himself for his chosen profession, and in the latter year he completed his studies and received his degree as a graduate in pharmacy. He then returned to Moberly, and held the position of prescription clerk in the Palace drug store, then owned by Sparks & Coates, until 1890, when he concluded to go into business for himself, and in August of that year he opened up a most beautiful drug store in the room on Reed street, now occupied by G. H. Werriers, clothier. He gave almost his entire attention to his business, and his success was amazing. His highest ambition seemed to be to own a drug store that would outshine anything in Moberly, and he set about to carry his ambitions into effect, and how well he succeeded all citizens of Moberly know. It is said that not a more handsome drug store is to be found in the state of Missouri. Mr. Last became a member of our Association in 1888, at the Detroit meeting.

George F. H. Markoe, of Boston, one of the originators of the Massachusetts College of Pharmacy, was found dead in his laboratory on the fifth floor of the Joseph Burnett Co.'s building, No. 36 India street, having expired as the result of a paralytic shock. There was probably no better known chemist in the State than Prof. Markoe, and his death will be a severe loss to the pharmaceutical profession. He was fifty-six years of age, his birth occurring at Valparaiso, Chili, June 10, 1840. When a boy of ten he went to Massachusetts and gained a thorough general and scientific education. He was a resident of Boston many years, but of late years had been living at Hull, where he purchased the John O'Reilly cottage. For the past five years he had been in the employ of the Joseph Burnett Company as head chemist. It was his custom to come and go when he pleased, and he frequently worked in the evening. A few years ago Professor Markoe suffered from a slight shock of paralysis, since which time he has been gradually failing in health and strength, and during the past few months had been exceedingly feeble. Notwithstanding that fact he would not give up working, and nearly every day was to be found in his laboratory. Besides being one of the founders of the Massachusetts College, he was also its senior professor. During the last term he lectured from the beginning of the College year to its close, when he was obliged to give up his position, owing to his fast failing health. It was with a great deal of reluctance that he resigned. As soon as his resignation was received he was elected to an honorary professorship in the college. He leaves a widow and two children. His son George is at present in the West, where he is in business. In 1875 Mr. Markoe was elected President of our Association. He served on many important committees and contributed a number of valuable papers. Deceased became a member of our Association in 1863, at the meeting held in Baltimore, Md.

Alfred H. Mason, of New York, died of pneumonia, November, 1896. Mr. Mason was born at Newcastle-under-Lyme, England, 53 years ago. He began his pharmaceutical career in 1857, when he was apprenticed to a chemist in Stafford. It cost $100 for him to learn the apothecary's art. In addition he had to scrub the floor and wash bottles till he understood what work meant. His master furnished him board for these services. At the conclusion of his term he was fitted to take an assistant's place and secured employment in Liverpool, where he speedily rose to the management of the business. In 1866 Mr. Mason became identified with the wholesale trade, taking a subordinate position and working his way up the ladder by hard work. In 1871 he began to take an in-

terest in social and educational organizations, being elected a Fellow in the Chemical Society of London. Two years later he was chosen vice-president of the Liverpool Chemists' Association, and the next year became president, a position he held till 1877, when he again became vice-president and retained that office as long as he remained in England. In 1875 he was chosen a member of the German Chemical Society of Berlin. From 1878 to 1880 he served on the executive committee of the British Pharmaceutical Society. He also joined several minor scientific societies, such as the Microscopical Society and the Literary and Philosophical Society of Liverpool. Mr. Mason came to America in 1884 to act as manager of the business of H. Sugden Evans & Co., Montreal, Toronto and Boston. He resided in Montreal, and, upon the retirement of Mr. Evans to take the government position of chief analyst of the Dominion, he became a member of the firm of Evans Sons & Mason. Mr. Mason withdrew from the firm of Evans Sons & Mason in 1888, and returned to England to represent the firm of Seabury and Johnson. In 1892 he was made secretary of the Seabury and Johnson corporation, and the next year went to New York to assist in the management of the concern. He was a member of the New York College of Pharmacy, and an active worker in the New York Pharmaceutical Association. He was a member of the National Wholesale Druggists' Association. He was a member of the Pharmaceutical Association of the Province of Quebec, and in 1886 served on the executive committee. In 1887 he was elected president of the Montreal College of Pharmacy, where he will always be remembered as the founder of the Students' Association. Mr. Mason was editor of the Journal of the Alumni Association of the New York College of Pharmacy. In our Association he served as chairman of the Committee on the drug market in 1886–87. Mr. Mason's family at the time of his death consisted of his wife and three children. Deceased became a member of our Association in 1884, at the meeting held in Milwaukee.

Charles W. Riley, of Philadelphia, died at his residence No. 1343 North 13th street, August 7th, 1896, aged fifty-two years (unmarried). He had been an invalid several years, and the greater part of the time confined to his home with heart disease. Mr. Riley was a graduate of the High School at Philadelphia, was engaged in the wholesale drug business for many years until his health failed him, when he was obliged to retire. He was largely interested in the affairs of the Orange Free State, South Africa, of which country he was the Consul General. He successfully negotiated the treaty between that country and the United States. Deceased became a member of our society in 1868, at the meeting held in Philadelphia.

Alonzo Robbins, formerly president of the Pennsylvania Board of Pharmacy, died suddenly at his home in Philadelphia, December 2d, 1896. He had been in failing health for some time, although able to be about until a day or so before his death. The immediate cause of death is thought to have been brain trouble. Mr. Robbins was one of the best known pharmacists in the State of Pennsylvania. He was born in Pottstown about sixty-three years ago, and when a boy went to Philadelphia, where he entered the Philadelphia College of Pharmacy, from which he was graduated in 1855, while employed in the drug store of John W. Simms & Son; subsequently he resided for a time at Richmond, Va., and at Trenton, N. J. Returning to Philadelphia, he was employed at various drug stores, after which he started in business for himself at 11th and Vine streets, where he continued till his death. In 1866 he became a contributing member of the Philadelphia College of Pharmacy, and in 1878 he was elected a member of the Board of Trustees of that institution, continuing to hold that office until the time of his death. In 1890 the Philadelphia College of Pharmacy conferred on him the degree of Master of Pharmacy. He was the first member of the State Pharmaceutical Examining Board appointed by Governor Beaver in 1887. Governor Pattison in 1892 reappointed him to the same position, which he filled until the close of the April examination in 1895, when, because of his greatly impared health, he resigned. Mr. Robbins rendered

valuable assistance in the framing of the pharmaceutical laws of Pennsylvania, and, as a member of the Committee on Revision of the Pharmacopœia, did exhaustive work in connection with the subject of fluid extracts. He was a member of the Pennsylvania Pharmaceutical Association, and an honorary member of the Louisiana State Pharmaceutical Association. He frequently attended the meetings of our Association, and took a great deal of interest in the proceedings. He leaves a widow, two daughters and a son. Mr. Robbins was elected a member of our Association at the meeting held in Boston, Mass., in 1865.

Mrs. Eliza Rudolf died of dropsy, on April 15, 1897, at her home in New Orleans, in the forty-fifth year of her age. Mrs. Rudolf was a pioneer woman pharmacist, and perhaps the very first woman to own and manage a drug store in the South. She was born at New Orleans, May 15, 1852, her maiden name having been Eliza Baden. Her education was not unlike that of thousands of southern girls who give their time to the refinements of home life while the men battle with the outside world. On July 22, 1876, when just 24 years of age, she became the wife of Theobald Rudolf, who owned a drug store at the corner of Dryades and Second Streets, New Orleans. They began housekeeping in their apartments in the same building. Two boys, Theobald and Gaspard, had been born, when, in 1878, the father fell a victim to the great yellow fever scourge which swept over the South in that year and claimed its thousands. Left to fight life's battles single-handed, with two babies dependent upon her, with no business training, and nothing but a drug store to which to turn for support, this brave little woman did not sit down in despair and invite fate to do its worst, but with a fortitude which was the marvel of all who witnessed it, she took hold of the business, about which she knew nothing, where her husband left off, and for 19 years conducted it with peculiar success. This was done too, in the face, for a few years at least, of odds which no man can appreciate, and which few men could have overcome. She knew two words, "I must," and listened not to others. At first, of course, she had to employ a competent manager. Then she applied for admission to the course of pharmacy in the old Medical College at New Orleans. She was refused admittance, but with dauntless courage she resolved to put her question of self-support to the test, and determine whether she should be cheated out of making a living as a druggist merely because she was a woman. She inquired into the laws on the subject of women in pharmacy. There were no laws at all determining whether the term "pharmacist" applied to men or women, and believing that it was a calling which would enable her to educate her children while superintending her own household affairs, Mrs. Rudolf began studying pharmacy at home. She read and studied and practiced putting up drugs for over three years, and when she considered herself quite competent, she one day almost paralyzed the Board of Pharmacy by presenting herself for examination. She passed an excellent examination, and received the coveted certificate. In 1891 she assumed charge of her own store; being faithful, exact and competent, the best physicians did not hesitate to recommend her, and so her patronage grew, and her name and her influence. When the Orleans Pharmaceutical Association was organized, almost from the first Mrs. Rudolf was chosen secretary, which position she held up to the day of her death. When the State Pharmaceutical Association was organized, the faithful secretary of the parish association was elected secretary, and this position too she held up to the time of her death. Those who knew the deceased intimately say that the gentleness and womanly beauty of her home life was not marred in the least by her business life. At home she was nobly rearing her two sons to manhood; the older will be graduated next year by Tulane University as a chemical engineer, and the younger, now 18, is studying to take up his mother's profession. They are said to reflect credit on their mother. Last summer, Mrs. Rudolf was attacked by typhoid fever, and she never quite recovered. Dropsical troubles set in, and for many months she had been a great sufferer. She bore her trials with resignation, and died as

she had lived, in Christian faith and hope. She breathed her last in the arms of her devoted boys and surrounded by a few faithful old friends. Mrs. Rudolf was elected a member of our organization in 1887, at the meeting held in Cincinnati.

Louis Sautter, one of Albany's leading druggists, died on January 14, 1897, at Round Lake, N. Y., from a complication of diseases. Mr. Sautter was in his sixty-seventh year. He came to this country during the forties, and engaged in the drug business in Brooklyn. Then he removed to Troy, and in 1856 opened a drug store on Green street, Albany. Since 1868 he has been doing business on the corner of Plain and South Pearl streets. Deceased was a member of the Albany College of Pharmacy and took considerable interest in its advancement. He was a member of the Board of Trustees, and at one time Vice-President of the College. He was a member of the New York State Pharmaceutical Association. He was married, and leaves four sons and five daughters. Mr. Sautter was elected a member of our Association in 1879, at the meeting in Indianapolis.

George H. Schacht, of Clifton, Bristol, England, died December 29, 1896, aged seventy-eight. He was a retail druggist of Bristol; was well known throughout England for his services to the cause of pharmaceutical education. He was enrolled an associate member of the Pharmaceutical Society in 1842, and became a member three years later, after graduating from the Society's school, with honors, as a pharmaceutical chemist. For the next twenty years he devoted himself assiduously to experimental work. Probably the best known of his inventions is Liquor Bismuthi (Schacht), a preparation the secret of which he guarded for several years. In 1863 he gave its composition to the Pharmaceutical Society as follows: Bismuth oxide, citric acid and ammonia, the quantity of bismuth oxide present in solution being one grain each fluid drachm. He also invented the preparation glycerinum amyli. Mr. Schacht has also been of service to the pharmacists of England in preventing the passage of unjust laws affecting pharmacy. When, in 1869, the Privy Council tried to enforce regulations for the storage of poisons, he took the lead in opposing them, and was entirely successful. Mr. Schacht was a heartv and persistent advocate of higher pharmaceutical education. He urged pharmacists all over the country to take advantage of the Government Science Classes. He himself acted as an examiner in the Society's school for a time, and believed thoroughly in the necessity of the course there pursued. He retired from the Council of the Society in March, 1896, after twenty-four years' continuous service. Mr. Schacht at one time held the position of Vice-President of the Pharmaceutical Society of Great Britain. Deceased was elected an honorary member of our Association in 1882, at Niagara Falls, N. Y.

Louis W. Sherwood, of Broad street, Columbus, Ohio, died on May 17, 1897, the result of an overdose of morphine, taken for the relief of severe neuralgic pains in the head. Mr. Sherwood was a prominent citizen of Columbus, and the announcement of his death was met by expressions of profound regret. He was a member of the Board of Directors of the Columbus Workhouse, President of the Columbus Savings Association, and had been a member of the board of water-works trustees. He was also prominent in secret society circles. Mr. Sherwood was born near Columbus in 1849, received his education at the Ohio Wesleyan University, and in 1875 opened a drug store on West Broad street, where he had since conducted a successful business. Deceased was elected a member of our Association at Niagara Falls in 1882.

Henry Shriver, the senior partner in the drug firm of Shriver & Co., in Cumberland, Md., and one of the best known citizens of that town, died there in the fifty-seventh year of his age. He was born in Cumberland, and was the son of the late Joseph Shriver, President of the First National Bank. He had served as a member of the city council, and was prominent in everything to promote the interests of the town. He was a conscientious man, and gained the confidence of all who knew him for his fair and honest business transactions. Deceased was married and leaves a widow and two sons to mourn their loss. He became a member of our organization in 1876, at the meeting held in Philadelphia.

Charles A. Sleuman, Jr., of Boston, Mass., died there in the early part of 1897. Mr. Sleuman was a well educated pharmacist, and took a great deal of pride in his profession. He was beloved and highly respected by all who became acquainted with him. Deceased was elected a member of our Association in 1892, at the meeting held at Profile House, N. H.

Louis H. Stoff, of New York City. He was born August 15, 1836, in Wallin, Prussia, studied pharmacy in his native country, passed all examinations successfully, and filled prominent positions as assistant pharmacist in various pharmacies in Germany and Switzerland. He emigrated to New York in the year 1865, and filled responsible positions. He subsequently went into business for himself—first on 10th avenue near 42d street in New York, and a few years later at 1180 Second avenue near 62d street, where he remained up to the time of his death. He died suddenly by a stroke of apoplexy. He was a highly educated pharmacist, and greatly esteemed as a member of the Society of the German Apothecaries of New York City. He was very successful in business. He was married, and leaves a widow and two sons. Mr. Stoff became a member of our Association in 1892, at the Profile House, N. H.

Julius E. F. Tanke, of Chicago, Ill., died there in 1896. Deceased was an able pharmacist, and highly respected and esteemed by all who knew him. He became a member of our Association in 1893 at the meeting held in the city of Chicago.

T. Larkin Turner, of North Weymouth, Mass., died at his home on April 11, 1897, after a long illness, aged 85 years. Mr. Turner was the son of Captain Turner, of Charlestown, a former well-known shipmaster in command of one of "Billy" Gray's famous East India merchantmen. He was born in Charlestown, August 17, 1812. He entered Harvard College in his 16th year, but did not complete his collegiate course, preferring to enter the office of one of Charlestown's noted physicians in pursuit of his studies in his chosen profession. At the age of 20 he made his first voyage to sea, going to the East Indies with his father. He afterwards became imbued with the spirit of travel, and for several years spent his time in visiting foreign countries, having traveled the world over several times. He was for many years the Government Superintendent of Roads throughout the southern States. He was the oldest member of the Boston Fusilier Veteran's Association, and was a member of the Massachusetts Pharmaceutical Association, the Massachusetts Historical and Genealogical Societies, the latter of which he was intensely interested in. He was one of the oldest members of our Association, having connected himself with us in 1853 at the meeting held in Boston, and later on became a life member.

Thomas McAleer Wehrly, of Washington, D. C., died there August 3, 1897; was born in York, Pa., February 8, 1846. Mr. Wehrly was educated at the public schools of the place of his birth. He began the study of pharmacy in the store of Adam Gosman in Baltimore, Maryland. After two or three years he went with his parents to Washington, D. C., where he made an engagement with Dr. D. B. Clarke, working for him several years. In 1887 he opened a store on his own account; this was at the corner of Third and H streets, N. E. At this location he continued in business until his death. Deceased was a member of the board of trustees of the National College of Pharmacy. He was of a very retiring disposition, not making many acquaintances; but the friends he had were very much attached to him. He lived with his sisters, to whom he was very much devoted, and never married. He became a member of our Association in 1883, at the meeting held in Washington, D. C.

William H. White, of Meridian, Miss., died April 11, 1897. He was born in Maringo county, Alabama, on the 22d of January, 1844. He began the study of the drug business with Messrs. Reed & Lewis at Meridian in 1868 and remained with them until the fall of 1878, when he entered the drug business for himself under the style of White & Smith. Some time in 1884 the firm of White & Smith went out of business,

and he continued the same until his death. Mr. White connected himself with our Association at New Orleans in 1891.

Frederic Wilcox, of Waterbury, Conn. He was secretary of the Apothecaries' Hall Company and one of Waterbury's prominent and highly esteemed citizens; died of uremia at his residence, 22 Mitchel avenue. He had been an acute sufferer for a long time, and had been confined to the house one month. He was born in Portland, Conn., June 26, 1845. He went to Waterbury at the age of fourteen and entered the employ of the Apothecaries' Hall Company. Later he took a course in chemistry and toxicology in the New York Medical College and Charity Hospital, receiving a diploma in 1861. Subsequently he spent several years in South America, buying vegetable ivory and India rubber. Returning to Waterbury in 1868, he spent a year with the Scovill Manufacturing Company, and later resumed his connection with the Apothecaries' Hall Company, and for many years was secretary of the company. He was a master of chemistry and at one time was State Chemist. For seventeen years he was secretary of the Connecticut Pharmaceutical Association, and at the date of his death was secretary emeritus of that organization. For two years he was vice-president of our Association. Born of good New England stock, Mr. Wilcox owed not a little to heredity. Conscientious as a boy, he developed a manhood whose foundation was love for the right and whose integrity has never been questioned. His attitude regarding all matters of public interest could ordinarily be surmised in advance, for he brought everything to the test of moral principles. In his positions he was as firm as the hills of his native Connecticut. They, however, veil their heart of granite with tree and shrub and flower. So he with all his stability was never unpleasantly angular and stubborn, but habitually possessed of a sweet reasonableness that retained for him the confidence and affection of those who might not accept his views. In 1871 he married Lucy Hodges, of Torrington, who survives him. Three children, William Hodges, Levi and Lucy McIntosh, also survive him. Deceased became a member of our Association in 1878, at Atlanta, Ga.

J. Henry Zeilin, of Philadelphia, Pa., head of the firm of J. Henry Zeilin & Co., manufacturers and dealers in a number of medicines, died on December 20, 1896, at Clifton Heights, N. Y., where he had gone several weeks previous to recuperate his failing health. Mr. Zeilin was in his sixty-second year, having been born in Chester, Pa., in 1834. His boyhood days were spent in town, and, when he became old enough, he was taught the drug business in the employ of the firm of John M. Maris & Co., at that time one of the largest houses in Philadelphia. Later on he went to Macon, Ga.; afterwards bought out his employers, and in 1890 returned to Philadelphia once more. Because of his belief in the efficacy of printer's ink, his business prospered to such an extent that the present plant was occupied in 1883. Mr. Zeilin lived at 216 Tulpehocken street, Germantown; and four children survive him, three daughters, who are married, and a son. Deceased was a life member of our society. He became a member in 1859, at the meeting held in Boston, Mass.

In concluding this report, your Secretary desires to thank all the officers and members of the Association for valuable assistance received during the year, which was furnished cheerfully and promptly whenever called upon.

Respectfully presented, GEO. W. KENNEDY,
Secretary of the Committee on Membership.

Pottsville, Pa., August 18, 1897.

Upon motion of Mr. Sheppard, seconded by Mr. Payne, the report was accepted and referred to the Committee on Publication.

MR. WHELPLEY: Mr. President, as chairman of the Auxiliary Committee on Membership, it might be well for me to make a few remarks supplementary to the report made

by the Secretary. The committee has been in existence for a number of years, and to it is undoubtedly largely due the great geographical distribution of the new members, representing twenty-eight States and Territories and several different countries, this committee having a representative in each State and Territory and each of the largest cities of the country and one in the government employ. During the past year the work has principally been confined to referring to the local members the names of those applicants for membership, that they may be found worthy of membership; the principal being that a man living in Illinois, and a member of this committee, is better able to judge of the desirability of receiving an applicant from that State than is the General Secretary of the Association or chairman of the Committee. In addition to this, considerable work has been accomplished by Mr. Huntington, representing the pharmacists in the government employ. The forty-one names submitted by him represent a little more than twenty per cent. of those employed. You can easily realize the kind of Association we would have had to-day if twenty per cent. of the desirable pharmacists in the retail business in the United States belonged to the American Pharmaceutical Association. During the past year, I think without a single exception, the presidents of the State Associations have called attention to the American Pharmaceutical Association in their annual addresses as presidents of their respective organizations, and I move that this Association extend a vote of thanks to the presidents of the different State Associations, and especially to Mr. Huntington, of the government service, for the interest they have taken in the work of the Auxiliary Committee on Membership during the past year.

The Reporter on the Progress of Pharmacy, C. Lewis Diehl, presented and read the introductory to his annual report, and, on motion of Mr. Sheppard, seconded by Mr. Dohme, the same was received and referred to the Committee on Publication.

THE PRESIDENT: Next comes the report of the Committee on the Revision of the United States Pharmacopœia.

MR. SHEPPARD: Mr. President, with the consent of the chairman of the Committee, Mr. Eliel, I move that the report be referred and read at the Section on Scientific Papers.

MR. ELIEL: I will gladly accept that, as I realize that this report will take up considerable time and I have an engagement that will prevent me from remaining long.

The motion was seconded by Mr. Good, and prevailed.

The Treasurer's report having been called for, Mr. S. A. D. Sheppard read same, as follows:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1896, TO JULY 1, 1897.

RECEIPTS.

Cash on hand, July 1, 1896	$1,342 09
Received from the sale of 12 Certificates @ $5 00	60 00
Received from the sale of 5 Certificates @ $7 50	37 50
Received from sale of Proceedings	40 30
Received from sale of Badges	16 20
Received from the sale of National Formulary	936 11
Received from Interest on Deposit in New England Trust Company, Boston.	40 08
Received from Interest on Money Invested in Bonds (General Fund)	150 00
Received from Centennial Fund	22 33

Received from Annual Fees, 1894	$260 00	
Received from Annual Fees, 1895	425 00	
Received from Annual Fees, 1896	3,545 00	
Received from Annual Fees, 1897	1,870 00	
Received from Annual Fees, 1898	5 00	
		$6,105 00
Received for Life Membership Fees, viz: Giles G. S. Simms		10 00
Received from Entertainment Committee of 1896, meeting at Montreal		111 78
Received from Richard J. Owens, donation		5 00
		$8,876 39

DISBURSEMENTS.

1896.					
July	30.	Check 571.	F. W. Barry, Beal & Co., Printing and Stationery		$45 35
	30.	Check 572.	John S. Bridges & Co., Printing and Stationery		25 86
	30.	Check 573.	George W. Kennedy, second half year's salary as Secretary of Council, 1895 to 1896	$25 00	
			Second half year's salary as Secretary of Committee on Membership, 1895 to 1896	75 00	
					100 00
	30.	Check 574.	S. A. D. Sheppard, second half year's salary as Treasurer, 1895 to 1896		375 00
	30.	Check 575.	Charles Caspari, Jr., second half year's salary as Permanent Secretary, 1895 to 1896		375 00
August	15.	Check 576.	A. B. Prescott, Special Committee on Research		22 96
	15.	Check 577.	F. G. Ryan, Printing and Stationery		16 86
	15.	Check 578.	James M. Good, Miscellaneous		3 00
	15.	Check 579.	Caswell A. Mayo, Committee on Transportation,		3 00
	15.	Check 580.	Booth Printing Company, Committee on Transportation		9 25
	15.	Check 581.	St. Louis Engraving Company, Badges		30 00
September	5.	Check 582.	Wickersham Printing Company, Proceedings	$16 75	
			Miscellaneous	2 50	
					19 25
	5.	Check 583.	Evening Chronicle, Printing and Stationery		11 00
	5.	Check 584.	James H. Beal, Section on Education and Legislation		10 18
	10.	Check 585.	H. M. Whelpley, Committee on Transportation,		2 00
	10.	Check 586.	Edward Kremers, First General Prize		75 00
	10.	Check 587.	Edson S. Bastin, Second General Prize		50 00
	10.	Check 588.	Alfred R. L. Dohme, Third General Prize		25 00
	10.	Check 589.	H. M. Whelpley, Committee on Membership.		6 30
	10.	Check 590.	M. J. Morrison, Services as Stenographer		125 00
	17.	Check 591.	S. A. D. Sheppard, Traveling Expenses		46 25
September	17.	Check 592.	Charles Caspari, Jr., Traveling Expenses		65 49
October	6.	Check 593.	Dr. George F. Payne, Committee on Status of Pharmacists in United States Army and Navy		97 50
	6.	Check 594.	Lyman F. Kebler, Committee on Indicators		22 33
	6.	Check 595.	Not used.		
	6.	Check 596.	Not used.		

October	19.	Check 597. C. Lewis Diehl, Second half-year's salary as Reporter on Progress of Pharmacy, 1895 to 1896		$375 00
	21.	Check 598. H. H. Rusby, Miscellaneous		5 67
	21.	Check 599. Alpha Photo-Engraving Company, Proceedings		19 79
	29.	Check 600. Wickersham Printing Company, Printing and Stationery		12 00
	29.	Check 601. James H. Beal, Section on Education and Legislation		8 25
November	5.	Check 602. Allen & Co., Printing and Stationery		23 50
	5.	Check 603. Charles Caspari, Jr., Proceedings	$10 72	
		National Formulary	3 02	
		Miscellaneous	35 29	
				49 03
	9.	Check 604. John S. Bridges & Co., Printing and Stationery	$40 99	
		Section on Scientific Papers	2 25	
		Committee on Status of Pharmacists in Army and Navy	9 21	
				52 45
	9.	Check 605. Wickersham Printing Company, Proceedings	$36 65	
		National Formulary	10 02	
		Section on Scientific Papers	2 75	
				49 42
	27.	Check 606. Evening Chronicle, Printing and Stationery		12 50
	27.	Check 667. John S. Bridges & Co., Section on Commercial Interests	$2 15	
		Printing and Stationery	5 04	
		Section on Education and Legislation	5 30	
				12 58
December	14.	Check 608. German Fire Insurance Co., Insurance		10 00
	14.	Check 609. F. W. Barry, Beale & Co., Printing and Stationery		45 35
	14.	Check 610. Wickersham Printing Company, Proceedings	$14 25	
		Miscellaneous	6 28	
				20 53
1897.				
January	20.	Check 611. Wickersham Printing Company, National Formulary		59 50
	20.	Check 612. John S. Bridges & Co, Printing and Stationery.		18 50
	27.	Check 613. Joseph E. Morrison, Miscellaneous		5 78
	28.	Check 614. S. A. D. Sheppard, First half year's Salary as Treasurer, 1896 to 1897		375 00
	28.	Check 615. C. Lewis Diehl, First half year's Salary as Reporter on Progress of Pharmacy, 1896 to 1897		375 00
	28.	Check 616. George W. Kennedy, First half year's Salary as Secretary of Council, 1896 to 1897	$25 00	
		First half year's Salary as Secretary of Committee on Membership, 1896 to 1897	75 00	
				100 00

January	28.	Check 617. Charles Caspari, Jr., First half year's Salary as General Secretary, 1896 to 1897		$375 00
February	3.	Check 618. S. A. D. Sheppard & Co., Printing and Stationery	$21 50	
		Miscellaneous	5 50	
				27 00
	3.	Check 619. Charles Caspari, Jr., Journals	$35 61	
		National Formulary	1 39	
		Proceedings	3 46	
		Miscellaneous	2 05	
				42 51
	10.	Check 620. Wickersham Printing Company, Proceedings	$2070 26	
		Printing and Stationery	9 00	
		Section on Scientific Papers	6 00	
				2085 26
	24.	Check 621. D. Bentley & Co., Printing and Stationery		7 40
March	9.	Check 622. Wickersham Printing Company, National Formulary	$8 75	
		Proceedings	18 60	
				27 35
	9.	Check 623. American Surety Company of New York, Premium on Treasurer's Bond		25 00
April	2.	Check 624. Charles Caspari, Jr., Journals	$17 75	
		Proceedings	2 13	
		National Formulary	99	
		Miscellaneous	5 56	
				26 43
	21.	Check 625. Wickersham Printing Company, Proceedings	$275 98	
		National Formulary	22 00	
				297 98
May	13.	Check 626. F. W. Barry, Beale & Co., Printing and Stationery		58 35
	18.	Check 627. Wickersham Printing Company, Proceedings	$12 01	
		National Formulary	4 31	
				16 32
June	12.	Check 628. Evening Chronicle, Printing and Stationery		4 51
	15.	Check 629. Wickersham Printing Company, Insurance	$5 50	
		National Formulary	5 48	
				10 98
	15.	Check 630. Charles Caspari, Jr., Proceedings	$1 86	
		National Formulary	76	
		Miscellaneous	5 94	
				8 56
	25.	Check 631. Wickersham Printing Company, National Formulary	$71 77	
		Section on Education and Legislation	18 95	
				90 72
				$6294 72
1896.				
July	20.	Life Membership Fund		10 00
				$6304 70

SUMMARY OF DISBURSEMENTS.

July 1, 1896, to July 1, 1897.

Proceedings	$2,482 46
Stenographer	125 00
Journals for Reporter on the Progress of Pharmacy	53 36
Salaries, Second Half of the Year 1895 to 1896	1,225 00
Salaries, First Half of the Year 1896 to 1897	1,225 00
Premium on Treasurer's Bond	25 00
Traveling Expenses	111 65
Section on Scientific Papers	33 33
Section on Education and Legislation	42 77
Section on Commercial Interests	2 15
Committee on Transportation	14 25
Committee on Membership	6 30
Special Research Committee of Scientific Section	22 96
Special Committee on the Status of Pharmacists in the Army and Navy of the U. S.	106 71
Printing and Stationery	357 70
Insurance	15 50
Badges	30 00
General Prizes	150 00
Miscellaneous Expenses	77 57
National Formulary	187 99
Amount paid for current expenses and National Formulary	$6,294 70
Life Membership Fund	10 00
Total amount of Disbursements	$6,304 70
Cash on hand July 1, 1897	2,571 69
	$8,876 39

APPROPRIATIONS AND EXPENDITURES UNDER SAME FOR THE FISCAL YEAR JULY 1, 1896, TO JULY 1, 1897.

	Appropriation.	Expenditure.
Proceedings	$3,000 00	$2,482 46
Stenographer	125 00	125 00
Journals for Reporter on Progress of Pharmacy	60 00	53 36
Salaries	2,450 00	2,450 00
Premium on Treasurer's Bond	25 00	25 00
Traveling Expenses	111 65	111 65
Section on Scientific Papers	125 00	33 33
Section on Legislation and Education	50 00	42 77
Section on Commercial Interests	50 00	2 15
Committee on Transportation	60 00	14 25
Committee on Membership	25 00	6 30
Special Research Committee of Scientific Section	74 78	22 96
Special Committee on the Status of Pharmacists in the Army and Navy of U. S.	147 50	106 71
Printing and Stationery	370 00	357 70
Insurance	30 00	15 50
Badges	30 00	30 00
General Prizes	150 00	150 00
Miscellaneous Expenses	103 35	77 57
		$6,106 71
Unexpended Balance		880 57
	$6,987 28	$6,987 28

Several items of financial interest during the year just closed deserve special mention.

Our cash balance last year was $1342.09. This year it is $2571.69. This increase of $1229.60 is a very pleasant fact, and should be noted. This is probably due to several causes, as follows:

First. The Entertainment Committee for the meeting at Montreal sent us $111.78, balance on hand after paying all expenses.

Second. The amount from the sale of National Formulary over the cost of the same during the year was $748.12.

Third. Another specially noticeable feature is the fact that our expenses for the Proceedings the past year have been diminished materially, thanks to our worthy General Secretary and the Committee on Publication.

The following items received from the Secretary show a decrease in cost of volume 44, as compared with volume 43, of $939.47.

Cost of Volume 44.		Cost of Volume 43.	
Composition, Paper and Presswork	$1798 06	Composition, Paper and Presswork	$2485 19
Binding	272 20	Binding	332 87
Illustrations	28 79	Illustrations	30 50
Expressage	325 40	Expressage	496 93
Postage	31 00	Postage	11 20
Journals for Reporter	53 36	Journals for Reporter	59 59
Stenographer	125 00	Stenographer	157 00
Reporter's Salary	750 00	Reporter's Salary	750 00
	$3383 81		$4323 28

Fourth. In the alphabetical list of payments accompanying this report it will be seen that more than two hundred members have paid for two years or more during the past twelve months. This probably indicates that the members generally are noting the list of payments published yearly, and desire to get their names into the current volume with the prompt men who have paid up for the year. It is to be hoped that more of our members will audit their own accounts by this published list.

During the year just closed, as well as for one or two previous years, great difficulty has been experienced in collecting the annual dues. At the annual meeting in Montreal the number of members in arrears was so large that your Treasurer held several very earnest conferences on the subject with leading members of the Association, and it was agreed by all that the general depression in business was so great that it would be wise to hold as many as possible on the roll for another year. This was done, personal letters were written to the delinquents, and only sixty-seven were dropped for non-payment of dues, although more than twice that number were in arrears.

At the present time, two hundred and forty-one members are three years or more in arrears. So many of our old and formerly active members are among the delinquents, that the Treasurer feels it his duty to recommend in many cases that their dues be remitted and their resignations accepted, instead of placing their names on the dropped list.

PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll at the next annual meeting, and also from members whose residence is unknown, there is now outstanding on the books of the Association:

Annual Dues for 1896	$960 00
Annual Dues for 1897	3805 00
	$4765 00

Respectfully submitted,
S. A. D. SHEPPARD,
Treasurer.

Boston, Mass., July 1, 1897.

MR. TORBERT: Is the report before the Association?

THE PRESIDENT: Yes, sir.

MR. TORBERT: I have sometimes thought at these meetings, as I have listened to the annual reports of Mr. Sheppard, that if Diogenes, in his search for an honest man, had turned his searchlight on Mr. Sheppard, he would have cried in exultation, "Eureka, an honest man" (applause); and I wish to move the acceptance of this report of the Treasurer, and include in the motion the thanks of the Association to our Treasurer for his faithful and honest work. (Applause.)

The motion was seconded by Mr. Kuhn and prevailed.

THE PRESIDENT: The Secretary will now read the proposed amendment to the By-Laws.

THE SECRETARY: The amendment to the By-Laws offered by Mr. Hallberg is as follows: "Amend Chapter V, Article III, by striking out the words 'On the changes in conditions of pharmaceutical institutions.'" Action on this will have to be deferred until the last general session.

THE PRESIDENT: The next in order is the report of the General Secretary.

THE SECRETARY: Mr. President and gentlemen, much of the work coming to the office of the General Secretary has been reported in connection with the President's Address, the Report of Committee on Publication, the Treasurer's Report, etc., so that there is but left for me to report on the financial accounts which have been placed in the hands of the General Secretary. These, of course, are always of interest to the Association.

REPORT OF FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY, FROM JULY 1, 1896, TO JUNE 30, 1897.

I. Receipts.

From Sales and Payment of Bills due July 1, 1896		$936 11

II. Expenses.

Paper and Press Work, 1000 copies	$71 77	
Binding 700 copies in cloth	77 00	
Binding 25 copies in cloth, interleaved	4 50	
Corrections and Electrotyping	5 48	
Expressage and Postage	29 24	
		187 99

III. Remittances.

To Treasurer, as per Treasurer's Receipts		936 11

IV. Sales.

To Dealers and Individuals, as per Ledger Accounts		766 60

V. Accounts Unpaid.

By Dealers		56 59

VI. Bills Due by the Association.

All Bills due to date have been paid.

VII. Stock on Hand.

Copies in flat sheets	1000	
" cloth	288	
" " interleaved	20	
" sheep	29	
" " interleaved	30	
		1,367

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF NATIONAL FORMULARY SINCE 1888.

Receipts to June 30, 1896 (see Proc. vol. 44, p. 33)	$9,143 88	
Receipts from July 1, 1896, to June 30, 1897	936 11	
		$10,079 99
Expenses to June 30, 1896 (see Proc., vol. 44, p. 33)	$6,057 38	
Expenses from July 1, 1896, to June 30, 1897	187 99	
		6,245 37

C. SALE OF PROCEEDINGS.

From July 1, 1896, to June 30, 1897	$40 30	
Remitted to Treasurer, as per receipts		40 30

D. ACCOUNT OF BADGES AND BARS.

July 1, 1896. On hand, as per Secretary's Report—Badges		26
Bars	54	
August, 1896. Received at Montreal	50	
		104
Badges sold from July 1, 1896, to June 30, 1897, 3 @ $2	$6 00	
Bars " " " 17 @ 60 cts	10 20	
Remitted to Treasurer, as per receipts		$16 20
Balance on hand, June 30, 1897—Badges		23
Bars		87
Total Receipts from Sale of Badges and Bars to June 30, 1896	$501 10	
Receipts from Sale of Badges and Bars from July 1, 1896, to June, 30, 1897	16 20	
		$517 30
Total Cost of Badges and Bars to June 30, 1896 (see Proc., vol. 44, p. 33)	$484 40	
Cost of Fifty Bars for Montreal Meeting	30 00	
		514 40

CHAS. CASPARI, JR., *General Secretary.*

Baltimore, July 1, 1897.

On motion by Mr. Dohme, seconded by Mr. Stewart, the report took the usual course.

The report of the Committee on Publication having been called for, the Secretary here read the same.

REPORT OF COMMITTEE ON PUBLICATION.

To the Council and Members of the American Pharmaceutical Association:

Gentlemen: Your Committee beg leave to report that the Proceedings of the forty-fourth annual meeting have been duly published. By special effort it became possible to have the books ready for delivery on February the first, eighteen hundred and ninety-seven, and a copy has been delivered to every member entitled, according to the Treasurer's accounts, to receive the same. Mindful of the necessity for judicious economy, and in accordance with the recommendations of the Finance Committee submitted at the last annual meeting, the Reporter on the Progress of Pharmacy and the Editor of the Proceedings have endeavored to reduce the size of the volume materially without prejudice to its value, and have succeeded in keeping within the bounds of one thousand pages, whereby a considerable saving in expenses was effected, as will appear below. On account of discouraging reports from the Treasurer regarding the payment of annual dues by members, it was decided to have but fifteen hundred copies of the Proceedings printed, of which thirteen hundred and thirty-five copies were bound in cloth and sixty-five in paper; of these two hundred and four copies remain on hand at this date, one hundred and ninety-nine cloth bound and five in paper cover. Again this year a part of the printed copies has been allowed to remain unbound until needed, and this plan appears desirable and should be continued in the future, so that the expense for binding may be kept more within the limits of demand.

Below will appear an account of stock on hand of Proceedings of various issues, and it appears desirable that some disposition should be made of the very large accumulation of copies in paper covers, at present stored in seventeen cases in Graham's Storage Warehouse, at Baltimore.

The cost of publishing and delivering the 1896 Proceedings has been as follows:

Composition, Paper and Presswork	$1,798 06
Binding 1,335 copies in cloth @ 20 cts.	267 00
Binding 65 copies in paper @ 8 cts.	5 20
Illustrations	28 79
Expressage	325 40
Postage, foreign and domestic	31 00
Journals for Reporter	53 36
Stenographer	125 00
Reporter's Salary	750 00
	$3,383 81

Cost of publishing and delivering 1895 Proceedings	$4,323 28
Cost of publishing and delivering 1896 Proceedings	3,383 81
Difference	$939 47

STOCK ON HAND JULY 1, 1897

	Paper cover.	Cloth bound.		Paper cover.	Cloth bound.
1851	251	0	1875	11	16
1852	34	0	1876	9	20
1853	38	0	1877	9	52
1854	7	0	1878	9	91
1855	55	0	1879	10	74
1856	0	0	1880	10	26
1857	10	5	1881	10	5
1858	20	7	1882	10	58
1859	0	0	1883	9	189
1860	0	162	1884	10	138
1862	0	234	1885	8	207
1863	0	221	1886	10	239
1864	10	70	1887	10	111
1865	10	6	1888	10	134
1866	10	39	1889	11	44
1867	9	44	1890	0	146
1868	10	126	1891	19	85
1869	0	107	1892	1	250
1870	9	44	1893	2	178
1871	10	29	1894	9	398
1872	10	16	1895	2	38
1873	8	67	1896	5	199
1874	8	0			
			Total	703	3875

Besides the above, there are still on hand, in flat sheets, for 1890, 51 copies; for 1895, 204 copies; for 1896, 87 copies. Also 17 boxes of paper-bound copies, about 900 or 950 volumes, and covering the years 1857–1888.

Respectfully submitted, C. LEWIS DIEHL, *Chairman.*

July 1, 1897.

MR. EBERT: I move that the report be received, and in connection with that motion, I also move that the Secretary be requested to bring to the annual meetings a number of loose copies of such pages of the Proceedings as give the list of officers and the places of meeting, also the Constitution of the Association, and the list of members by States, so that when we meet together we do not have to run around to find a single copy of the Proceedings, which is usually in the hands of the Secretary or Treasurer, in order to familiarize ourselves with what has gone on for a number of years.

The motion was seconded by Mr. Orton, and prevailed.

The following reports of the Auditing Committee regarding the accounts of the Chairman of Council, Treasurer and General Secretary, were presented and read, and on motion of G. W. Kennedy, duly seconded, referred to the Publication Committee:

To the Council and Members of the American Pharmaceutical Association Meeting at Minnetonka Beach, Minn., August 24, 1897:

The undersigned committee, appointed by the Council of the American Pharmaceutical Association to examine the books and annual report of the Chairman of the Council,

as also the invested fuuds of the Association, report same to be correct and agreeing with the books of the Treasurer.

Respectfully submitted,

LEWIS C. HOPP,
PHILIP LEHR,
H. J. SHERWOOD,

Cleveland, July, 1897.

To the Council and Members of the American Pharmaceutical Association Meeting at Minnetonka Beach, Minn., August 24, 1897:

The undersigned committee, appointed by the Council of the American Pharmaceutical Association to examine the books and accounts of the Treasurer, have performed the duties assigned them, and report that they have found, after a most thorough examination, all the entries correct, and the disbursements to correspond with the vouchers.

Respectfully submitted,

LEWIS C. HOPP,
PHILIP LEHR,
H. J. SHERWOOD.

Cleveland, July, 1897.

To the Council and Members of the American Pharmaceutical Association Meeting at Minnetonka Beach, Minn., August 24, 1897 :

The undersigned committee appointed by the Council of the American Pharmaceutical Association to examine the books and report of the General Secretary, have performed the duties assigned them, and found the books and annual report to be correct and agreeing with the books of the Treasurer.

Respectfully submitted,

LEWIS C. HOPP,
PHILIP LEHR,
H. J. SHERWOOD.

Cleveland, July, 1897.

The Secretary, at the request of the Chairman, read the report of the Committee on General Prizes, as follows:

LAKE MINNETONKA, MINN., *August* 24, 1897.

To the Council of the American Pharmaceutical Association :

The undersigned committee appointed by the President of the Association at the meeting at Montreal in 1896, respectfully submits the following report:

After carefully examining the various papers submitted, we recommend that the prizes be awarded as follows:

First Prize, to James W. T. Knox and Albert B. Prescott for their paper on the Caffeine Compound in Kola.

Second Prize to S. P. Sadtler for his paper entitled, "Some Results Obtained in the Destructive Distillation of Linseed Oil, with Remarks on Its Bearing on Engler's Theory of Origin of Petroleum."

Third Prize to W. O. Richtmann and Edward Kremers for their paper on "The Menthol Group."

Respectfully submitted,

FRANK S. HERETH,
GEORGE F. PAYNE,
W. H. CHAPMAN,

(Applause.)

On motion, which was duly seconded, the report took the usual course.

Mr. Hallberg offered the following amendment to the By-Laws, which

was read by the Secretary and laid over for action at the final general session.

Amend Articles V. and VI. of Chap. IX., by striking out in both articles the words "six months," and insert in place thereof the words "one year."

Mr. Sheppard next read the report of the Committee on Ebert Prize as follows:

REPORT OF THE COMMITTEE ON EBERT PRIZE.

The Committee appointed to consider the awarding of the Ebert Prize, having carefully examined all the papers presented at the forty-fourth annual meeting, have decided unanimously that the prize should be awarded to Mr. James W. T. Knox and Prof. Albert B. Prescott, for their paper entitled, "The Caffein Compound in Kola."

H. H. Rusby,
S. A. D. Sheppard,
Wm. H. Chapman,
Committee.

On motion, which was duly seconded, the report took the usual course.

The President: We now have the Special Committee reports. The first will be that on President's Address, and I would like to give notice now that immediately after the report of the Committee on President's Address we will take up the report of the Special Committee on Time and Place of Next Meeting.

Mr. Ebert read the report of the Committee on President's Address as follows:

REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

Your Committee respectfully submit the following recommendations concerning the excellent address of the President:

We recommend that the various State Pharmaceutical Associations be requested to contribute to this Association such meritorious and valuable papers as are read at their meetings, for the use of the Reporter on the Progress of Pharmacy, so that the same may be incorporated by him in his report, either in full or in abstract, and thus give wider circulation and preserve them in a more accessible form.

We approve of the suggestion for bettering the standard of the apprentice by requiring a higher educational standard than at present demanded by the employer and the schools of pharmacy.

We endorse the President's logical deductions on the liquor traffic by druggists, and hope that the Association will coincide with the recommendations of the American Medical Association to drop these beverages from the list of official preparations in the next revision of the U. S. Pharmacopœia.

We approve of the recommendation that a special committee be appointed to take such steps for obtaining reform in our national laws bearing on the question of patents and trade-marks for medicinal substances as to relieve us from the seeming monopoly that the present laws permit.

Respectfully,

Albert E. Ebert,
H. M. Whelpley,
W. S. Thompson.

MR. THOMPSON: I move that the recommendations of the Committee on the President's Address be adopted.

The motion was seconded by Mr. Bartells.

THE PRESIDENT: It has been moved and seconded that the recommendations of the Committee on the President's Address be adopted. Do you wish to have the report read again?

MR. WHITNEY: I should like to know whether the adoption of the recommendations of the Committee practically adopts and accepts the action of the medical society who propose to eliminate from the Pharmacopœia the use of brandy and whiskey. As I understand it, that would be practically the result, and the time for the discussion of that point is now. Am I correct, Mr. President?

THE PRESIDENT: Yes, it will do that. Now is the time for you to object to the report, if such is your desire.

MR. WHITNEY: Mr. President and Gentlemen: Coming from Massachusetts, where we have had no little experience upon this matter, I deem it proper for me to say just a few words. I will try to be as brief as possible. I admit that I represent a great many friends in Massachusetts who would be glad to have this recommendation adopted and liquors eliminated from the drug store, and everything of an intoxicating character; but, gentlemen, let me assure you of the result that will follow in our State if this action is taken. We have gone before our legislative body there, and said we have been dragged in the mud by the reputation which they have given us, and we propose, if it is possible, to be relieved from that. They have given us a one dollar license, surrounded with many hard things perhaps, but yet enough to control the sale for strictly medicinal purposes and not for drinking, and that, I submit, is what we want liquors in the Pharmacopœia for, for medicinal purposes. Now, to admit that we are so weak, so imbecile, I may say, that we cannot control it, and have the Medical Association so proclaim it, and this Association so proclaim it, what will be the result? The legislatures will say that if we cannot be trusted with such assistance as they have given us, how can we be trusted with cocaine, and morphine, and all the other evils that are so much greater—and down goes our house and everything that we have gained, and we become mere people of commerce. Now, we in Massachusetts have stood up manfully and fought this, and on that ground Massachusetts has already closed up more than two hundred drink shops and we are coming out at the top of the heap. If it continues for ten years, there will be only reputable drug stores and nothing else. (Applause.) Now, gentlemen, I do not want to block our progress. Progress never made rapid strides by calling herself weak. Progress is made in a straightforward, honest, and manly line, defending what belongs to you, and I maintain upon this floor, gentlemen, that there is no remedy in the Pharmacopœia that has been of more use, more service, than brandy and whiskey when properly applied. And to go back to Massachusetts and have it thrown in my face that the American Pharmacentical Association has declared publicly that they are not strong enough to handle the products of the Pharmacopœia and want to throw them out, is an admission that I cannot stand upon without protesting against it. (Applause.)

MR. MAYO: Mr. President, I wish to add a few words from the practical side of the question. This last winter I had occasion to appear before the state legislature of New York with a view of getting some concessions in the matter of liquor legislation. It is the height of folly, I think, for us to dictate to physicians what they shall prescribe. I am quite sure that practical men will agree with me on that point. If we think we can keep the physicians from prescribing whiskey and brandy by taking them out of the

Pharmacopœia, we are very much mistaken. A study of the number of prescriptions written for liquor shows that the number is very small indeed, but the mere fact that they are not obtained on written prescriptions, does not indicate that they are not used by physicians. In appearing before the legislature last winter, the strongest argument that we were able to bring to bear was the history of liquor legislation in Massachusetts. The history of that legislation is no doubt familiar to you all. I think that one of the wisest things that this Association has ever done is the fact that we have elected Mr. Whitney as our President. He has demonstrated the fact, as President of the Board of Pharmacy of the state of Massachusetts, that liquor can be handled by the druggists without smirching the fair name of the pharmacists in Massachusetts, under that liquor law, and but for a mere technicality New York state would have had virtually the same law that Massachusetts has. They all agree that under the conditions there existing there is no difficulty at all in giving liquor license to druggists.

To show what the example of Massachusetts has done, on our way out here I met the members of the Board of Pharmacy of Detroit and found that they were very anxious to meet the Pharmacy Board of Massachusetts before they proposed to endeavor to get some liquor legislation on exactly the same line as Massachusetts.

The fact that liquor is in the Pharmacopæia has very slight bearing on the question whether we should have it in our stores or not. We should have it in our stores as long as the physicians prescribe it. If liquor is not in the Pharmacopœia and we go before the legislature and tell them that we want to handle liquor, they say, on the basis of your own authority, there is no necessity for your handling liquor; whereas, in practice there is a necessity existing for us to handle liquors to a certain extent, at least, and I think it would be decidedly detrimental and a backward step to take the liquors out of the Pharmacopœia on that ground.

MR. WHITNEY: Mr. President, as Mr. Sheppard has been shown to be an honest man, not only in his financial matters, but in all matters in which he is interested, and as he was the author of the Massachusetts law—after giving it diligent study for 365 days, after it had been rejected by the committee of the legislature, he was still so strong and so firm in his convictions, thought it was right and for the best interests of the commonwealth, so persistent, that he had it brought up again in the House and carried it through in spite of the adverse committee to whom it was referred—he knows its working, he being the author of it, and I call upon him to defend it.

MR. EBERT: I would like to hear Mr. Sheppard; no doubt he will give us that information; but we would like to know what the law of Massachusetts, the state law, is in regard to the sale of liquor.

MR. SHEPPARD: Mr. President, for many years Massachusetts has had a law which we call the Local Option Law, giving cities and towns the right to vote, each for itself, whether license should be granted. That does not include the druggist's license; that means saloon licenses. In addition to that, the authorities of each city and town have the right to vote on the druggists' licenses. This law of which Mr. Whitney speaks is a very simple one, and I think it works well because of its very simplicity. Any one who has had anything to do with the liquor traffic in trying to hedge it up in any way knows that it is very difficult to get evidence. It is very difficult to catch a liquor dealer. He is worse than an eel or a mouse—he slips through—therefore this law was based on two general propositions, viz., that the Board of Pharmacy should say that in their judgment the druggist was a proper man to have a liquor license, and, second, that in their judgment the public good would be advanced by his having a liquor license. They are left entirely at liberty to make up their judgment in any way that they see fit. They are not obliged to bring in any evidence whatever against the man. They have simply to make

up their minds either that he is not a proper person, or, if he be a proper person, that the public good, on account of his location, will not be advanced, and they will not give him a certificate. If they will not give him a certificate on those two facts, the local authorities cannot grant him a liquor license. They can refuse though to grant a liquor license, even if the man has the certificate of the Board of Pharmacy.

Now, to go over the same ground very shortly as a summary, a druggist in Massachusetts to get a liquor license must first go to the Board of Pharmacy and receive from them a certificate showing that he is all right and the public good demands it. He then takes that certificate to the local authorities, the Board of Aldermen in the cities, or the Board of Selectmen in the town, and those men say yes or no. They cannot say yes without it; they can say no if he has it. The law has been working now since 1894, three years. We have tried it and it grows stronger and stronger every year, and, as Mr. Whitney says, we have turned out nearly two hundred rum druggists and we mean to turn out more of them; and those that remain shall sell liquor for only mechanical, medicinal and chemical purposes.

I would say, gentlemen, that I do believe that this is one of those things that we do not want to go at bull-headed. We want to work in a shrewd and careful way, and I do not believe we have come to the time when we are ready to take the radical action that is proposed in this report. Not that I am not thoroughly in favor of it, but I do not think the American Pharmaceutical Association wants to take that position to-day. Perhaps twenty-five years hence it may be able to. It is a good thing to keep the ideal before us. But remember we do not want to spoil a lot of other good things by trying to climb to the moon; so, Mr. President, I move as a substitute for the pending motion, that the report be accepted, leaving out the recommendation in regard to liquors in the Pharmacopœia.

The motion was seconded by Mr. Hallberg.

MR. ELIEL: Mr. President, being to some extent responsible for this discussion, by introducing this resolution in the report of the Committee on the Revision of the Pharmacopœia at the Montreal meeting, I think it is nothing more than justly right that I should have something to say upon this question. I have attended a great many meetings of this Association, and this question has come up a great many times. I would like to state in support of that recommendation that the legitimate use of whiskey and brandy in pharmacy has never been, in my experience and in the experience of a good many with whom I have conversed, sufficient during the year to cover the cost of the license which the United States government requires us to pay before we can handle these things. That is one reason why I made this recommendation; and another reason is that while conditions in Massachusetts may be such that it may be desirable to retain liquors in the Pharmacopœia, the conditions in many other states are such that it may be desirable to eliminate them entirely. Now, I am certain that in the state of Indiana wherein I reside, it would be well if these liquors could be eliminated from the Pharmacopœia. We are not surrounded by safeguards as the state of Massachusetts is. The state laws require us to refuse all sales of liquors less than one quart. We cannot dispense or sell one ounce of whiskey or brandy without a prescription from the physician. But we can sell a quart or a gallon or any quantity up to four and three-quarter gallons to the same party. Now that is not a desirable state of affairs. We have a great many stores in Indiana which, I am sorry to say, exist under this law, and for my sake and for the sake of those who are residing there, I would like to see liquors eliminated from the Pharmacopœia.

Messrs. Torbert and Alpers also discussed the subject and spoke against

that part of the committee's report recommending the elimination of liquors from the Pharmacopœia, after which the President submitted the motion of Mr. Sheppard to a vote, and the same prevailed.

MR. KUHN: Mr. President, in a spirit of fairness, I would like to move that the report of the Committee on Time and Place of Next Meeting be deferred until near the end of the session, and be immediately preceded by the consideration of the names proposed.

MR. HALLBERG: I desire to call upon the Secretary to read Article II. Chapter VII., of the By-Laws on Membership.

The Secretary having read the article, Mr. Hallberg continued as follows:

Now, Mr. President, in accordance with the article just read, I move that the members whose names have been posted be declared members of this Association if they have complied with the By-laws.

The motion having been seconded by Mr. Kuhn, was put and carried.

On motion of Mr. Mayo, which was duly seconded, a recess of five minutes was taken to allow the applicants whose names had been posted to sign the Constitution and By-laws and become members.

THE PRESIDENT: We will now have the report of the Committee on Time and Place of Next Meeting.

MR. SHEPPARD: Mr. President and Gentlemen, I think you will all bear me out in the idea often expressed here that the report of this committee and the action thereon is very much like a choir of music in a church—it is always considered to be our "war department," and that is what I have to report. We have three reports to make—the majority of three members, Mr. Dohme, Mr. Jacobs and myself, report in favor of Baltimore; time, first Monday in September. (Applause.) Mr. Kuhn has another report which he will read later, recommending Omaha. (Applause.) Mr. Miller, who will speak later, recommends Richmond. (Applause.) Your Committee had also before them an invitation from Texas, and also an urgent invitation that came by correspondence, that we meet at Asbury Park.

I ask, Mr. President, that these reports be received, and that then the members of the committee be allowed to speak as is always the custom in this matter, before members of the Association take part in the discussion.

The motion was seconded by Mr. Mayo and prevailed.

MR. SHEPPARD: Mr. President and Gentlemen, as representing the majority of the committee, I desire to say a word as to their reason for selecting Baltimore. First, Baltimore has been applying for this privilege for three years; this is the third application. It is the first application that Omaha has presented; it is the first application that Richmond has presented; the first application that Texas has presented, and the first one, and that not in due form, from Asbury Park.

Secondly, it has been the policy of this Association during the last twenty-five years especially, to see what good it could do, and also what good it could get, from meeting in the various parts of the country. It is the American Pharmaceutical Association, and it has always been conceded to be the duty of the Association to cover the whole coun-

try; therefore, it has always been conceded the duty of the Committee to consider what has been the record of our meetings during the previous ten or fifteen years, or more particularly the last five or seven years. The committee considered that point—what has been our record? The Association membership, I think I may safely say within bounds, is three-quarters of it bounded by a line which would not go west of Chicago or south of Louisville or Baltimore. During the last four years we have not met in that section where at least three-quarters of our members are. We have met in Denver, in Asheville, in Montreal, and now at the Twin Cities; therefore, it would seem very right and proper that we should cover the part of the country where so many of our members live, from a geographical standpoint. If that fact were admitted, the location which is offered by Mr. Kuhn, so earnestly pressed here yesterday with an urgent invitation from Omaha, would be thrown out; and yet I hope we shall meet in Omaha; but I think that this coming meeting of 1898 should go to Baltimore, and the majority of the committee agree with me that 1898 is not Omaha's year. That would bring the question down to Richmond, and Baltimore, and Texas, and Asbury Park. Texas belongs to the same line as Omaha; it is outside. Asbury Park has no direct representative on this floor, unless it be Mr. Thompson, and Mr. Thompson did not appear before the Committee. That brings us down to Richmond and Baltimore, one of the largest cities in the country and of large and active membership. They have come up here three times and asked us to go there. We know we shall get good there and we shall do good, and the question whether we shall go to Baltimore or to Richmond brings us to the comparison. The fact that after the Old Point Comfort meeting a great many of us went up to Richmond and had a kind of family reunion there—that would seem to throw out Richmond as compared to Baltimore. (Applause.)

Now, I think I have given you the reasons why the majority of the committee decided that Baltimore should have the preference, and I now yield the floor to Mr. Dohme.

MR. DOHME: Mr. President and Gentlemen, in speaking of the peculiar fitness of Baltimore for our next meeting, I need hardly refer to the fact that it is one of the largest cities in the Union, famed for its hospitality, for its fair women, for its many institutions of learning, its great hospitals, its great liberality, its strong membership in this Association, and also famed as being the home of the oyster, the canvas-back duck, soft-shell crabs, and the other many delightful delicacies, which make it such a desirable meeting place for our conventions and all similar gatherings.

Besides all these, it is within forty-five minutes ride of Washington, the capital of this country, and considered as a place of residence the most beautiful city on this continent. We are near the battle-field of Gettysburg, one of the most interesting spots to visit in this country, and many other attractions that I might mention; and not only that, but it has among its membership some of the oldest members of the Association, and it has three times appeard here, as Mr. Sheppard has said, and requested the Association to meet there. We could have secured invitations from the city council and the mayor and governor, but we did not deem it necessary. We know that when you come to Baltimore our members will be heartily welcomed.

MR. JACOBS: Mr. President, after listening to the remarks of Mr. Sheppard and Mr. Dohme, I feel that it is unnecessary for me to say anything in favor of Baltimore.

MR. KUHN: Mr. President and Gentlemen, when Mr. Sheppard spoke he put me in mind of Richelieu, when he added, "At some future time we shall meet in Omaha." Richelieu, you remember, says to Joseph, "*You shall be a Cardinal.*" Now we are not willing to be made cardinals; we want the meeting next year, and I voice the wish of the Governor of Nebraska and the sentiments of the city council and the Commercial

Club of Omaha; I also have an invitation from the Nebraska State Pharmaceutical Association to meet there in 1898.

Omaha is the gateway to the west; it is the commercial metropolis of the great west; has risen from a little burg of twenty years ago to the commanding position of one hundred and forty thousand, with an increase of population from 1880 to 1890 greater in per cent. than any other city of over 100,000 in the United States; a state where the value of the corn crop of this year equals twice the output of gold last year in the United States, where we are to have the trans-Mississippi Exposition, which will be second to none except the World's Fair at Chicago. Some of the members claim that that will detract from the meeting, but we want to assure you that the meetings will be so conducted that the members will stay at the meetings, and see the attractions afterwards.

And as to being not centrally located, geographically speaking, Omaha is more centrally located than any other city in the United States, taking the United States proper into consideration. It is nearer the center of population of the United States than Baltimore by about three hundred miles. It is accessible from all ways and from all points of the country, and railroad rates will be obtained there that cannot be equaled by any other city next year. They will have concessions in the way of coming by one route and going by another. We are desperately in earnest regarding this, and, as to our hospitality, we assure you that no other city can outdo us. We have twenty-three conventions that are to meet there next year, and we want to make the American Pharmaceutical Association the twenty-fourth; and I move you, Mr. President, that Omaha be declared the place of the next meeting.

MR. MILLER: Mr. President and Gentlemen, I feel almost floored by the eloquence of these older members; I feel as though I am a stranger among you. But, I want to say that we, the druggists of Richmond, the people of Richmond and Virginia, the business people and all our municipal officers, are anxious to have you there. One of the gentlemen referred to the fact that the Association had not been in Baltimore for twenty-seven years: it has not been in Richmond for twenty-four years, and it has been in Baltimore three times since its organization, and it has been in Richmond only once. In point of membership of the Association I am not positive, but I think that Richmond has a larger percentage or a larger membership in proportion to her population than Baltimore has. I think that is right; and in regard to our hospitality, I think it is hardly worth while to say anything. We certainly will extend the hospitality of Virginia to the American Pharmaceutical Association, and as to canvas-back duck, their home is there as much as in Baltimore. And another thing it is noted for, and I think the originator of, and I think the Association will appreciate this quite as much, and that is our mint julep. I want to say that we would be very glad indeed to have you down there. We have one of the finest hotels in the country. It may not be quite as large as your western hotels, but the appointments and service are perfect. We have a roof garden there that will be enclosed by next summer, that will seat comfortably eight hundred people. We have two large committee rooms, or committee halls they call them, that will seat from 150 to 200 men, and seat them comfortably, and the house is a beautiful one. I have a letter from the proprietor urging the Association to come and make its headquarters there. Just one word more. There was one point that I failed to note, that is the historical interest in and around Richmond, dating back to the settlement of this country, both in colonial times and revolutionary times, and clear up until the late war. We have many of them that are within easy reach and accessible to Richmond, and we propose if you will come there, to show you nearly all those points of interest, and to take you down to old Williamsburg, down the James, and show you all the old battlefields. I hope it will be the pleasure of this Association to adopt Richmond as the place of meeting for 1898.

MR. TORBERT: Mr. President and Gentlemen, I am impressed with the fact that every member of this Association ought to vote on this question, solely and simply from the standpoint, what are the interests of this Association? To suggest on the one hand mallard ducks and on the other hand mint juleps, which pharmacists do not use as they are not in the Pharmacopœia, impresses me as reducing this question to a *reductio ad absurdum*. Now, then, Mr. Sheppard stated that the greatest number of our membership lay in a boundary line about and diverging from Baltimore. He also stated that he wanted this Association to go where it might reap the largest benefit. He suggested that it had not been in that region of country, and he traversed far enough back to mention that it met in New Orleans, that it met in Louisville, that it had been within forty-five minutes' ride of Baltimore only within a comparatively recent time. Now, when the Exposition was held in Chicago we all held up both hands from every section to go to Chicago to see the sights and to make the meeting there historic, and it was the historic meeting of this Association. Now, Omaha proposes to invite you to an exposition which will only be, as the gentleman stated, second to the one at Chicago, and it will be another historic meeting of this Association; and, mark you, gentlemen, it is in that large country where we are short in membership, and where there will be an assembling of pharmacists from all over that part of the country, and we will gather them in and swell the membership of this Association as it has never been increased at any meeting in its history. (Applause.)

THE PRESIDENT: I have allowed this speaking to go on because we have all enjoyed the oratory, but it is slightly out of order.

MR. TORBERT: I move you, Mr. President, in order to bring this question to a conclusion, that a ballot be taken, and the city which has the lowest number of votes be dropped on the second ballot, and the balloting proceed until a decision is reached by a majority vote.

MR. HALLBERG: I second the motion.

The motion of Mr. Torbert was put and carried.

THE PRESIDENT: I will appoint as tellers Mr. Mayo, Mr. Bartells, Mr. Frost and Mr. Bobbitt.

The Convention proceeded to ballot, after which, the report of the tellers having been called for, Mr. Mayo announced the result as follows:

Whole number of votes cast, 92, of which 1 was defective and thrown out. Of these 34 were cast for Omaha (35 with the defective one), 49 for Baltimore and 8 for Richmond; number of votes necessary to choice, 47. (Applause.)

MR. SANDER: Mr. President, as I voted for Omaha, I think I am entitled to make the motion to make the vote unanimous for Baltimore.

The motion was seconded by Messrs. Kuhn and Miller, and prevailed.

MR. MAYO; Mr. President, I move that the matter of time be left to the Council.

MR. HALLBERG: I move as a substitute that the matter be taken up at the last session of this Convention.

This motion was duly seconded and prevailed.

The following amendment was proposed by Mr. Sheppard, and having been read, was laid over for action at the final general session.

Amend Article IV, Chapter V, by adding thereto the words: "An introductory or synopsis of the report to be presented to the Section on Scientific Papers."

On motion, duly seconded, the Association adjourned until Saturday at 2:30 p. m.

THIRD SESSION—WEDNESDAY AFTERNOON, AUGUST 25, 1897.

No business was transacted by the Association previous to the meeting of the Section on Commercial Interests.

FOURTH SESSION—THURSDAY MORNING, AUGUST 26, 1897.

No business was transacted by the Association previous to the first session of the Section on Scientific Papers.

FIFTH SESSION—THURSDAY AFTERNOON, AUGUST 26, 1897.

No business was transacted by the Association previous to the second session of the Section on Scientific Papers.

SIXTH SESSION—THURSDAY EVENING, AUGUST 26, 1897.

No business was transacted by the Association previous to the third session of the Section on Scientific Papers.

SEVENTH SESSION—FRIDAY MORNING, AUGUST 27, 1897.

No business was transacted by the Association previous to the first session of the Section on Pharmaceutical Education and Legislation.

EIGHTH SESSION—FRIDAY AFTERNOON, AUGUST 27, 1897.

No business was transacted by the Association previous to the second session of the Section on Pharmaceutical Education and Legislation.

NINTH SESSION—SATURDAY MORNING, AUGUST 28, 1897.

No business was transacted by the Association previous to the third session of the Section on Pharmaceutical Education and Legislation.

TENTH SESSION—SATURDAY AFTERNOON, ATGUST 29, 1897.

The Association met in general session at 3:10 p. m., with President Morrison in the chair.

The Secretary read the minutes of the second general session, which, upon motion of Mr. Bartells, seconded by Mr. Main, were approved as read.

The President having called for the minutes of the Council, the Secretary of Council, G. W. Kennedy, read the following report of meetings held since adjournment of the last general session:

SEVENTH SESSION OF THE COUNCIL—AUGUST 24, 1897.

Conncil convened at 1 o'clock p. m., at the Hotel Lafayette. Chairman W. S. Thompson presided, with eleven members present.

On motion of C. L. Diehl, the reading of the minutes of the sixth session was dispensed with.

The following communication was presented for action of Council by the Committee on the Centennial Fund:

CLEVELAND, O., *July* 31, 1897.

To the Committee on the Centennial Fund of the A. Ph. A.:

Gentlemen: I hereby make application for the amount of fifteen dollars ($15.00) expended in the preparation of a paper sent to the Chairman of the Committee on Scientific Papers, Mr. W. C. Alpers, on July 27th. The investigation is entitled "Chemical Composition of Commercial Extract of Witch Hazel," and resulted in an addition of value regarding the nature of this liquid. The sum expended covered about forty items, including specimens of Witch Hazel from various sources, special reagents, apparatus, etc.

Very respectfully yours, JOSEPH FEIL.

On motion of C. L. Diehl, it was decided not to grant the request made by the writer, for the reason that it does not agree with the By-Laws.

The following amendment to By-Laws of Council was proposed by Chas. Caspari, Jr., and laid over for future action:

Amend Art. I., Chap. IV., by striking out in the first line the word "five" and inserting the word "seven" in place thereof.

On motion of J. M. Good, it was agreed to recommend to the Association that Art. X., Chap. IX., of the By-Laws be amended by inserting the words "or Minneapolis" after the words "St. Paul" and preceding the comma sign.

Communications from E. L. Ruddy of Montreal, Can., and H. L. Palmer, of Chicago, Ill., relative to the publication of an illustrated history of the American Pharmaceutical Association, were presented, read and discussed. On motion of C. S. N. Hallberg, the chairman of the Council was requested to appoint a committee of three on celebration of the fiftieth anniversary of the Association occurring in 1902, and to whom all matter relating to the publication of the history of the Association shall be referred.

On motion, Conncil adjourned.

GEO. W. KENNEDY, *Sec'y.*

EIGHTH SESSION OF THE COUNCIL—AUGUST 28, 1897.

Council convened at Hotel Lafayette at 9 a. m, Chairman Thompson presiding, with the following members present: Messrs. Caspari, Dohme, Ford, Frost, Good, Hechler, Hopp, Kennedy, Payne and Sheppard.

Minutes of the seventh session were read and approved.

The chairman appointed J. M. Good. C. S. N. Hallberg and S. A. D. Sheppard a committee on semi-centennial celebration, as provided for at the previous session of Council.

On motion, Council adjourned.

GEO. W. KENNEDY, *Sec'y.*

FIRST SESSION OF THE NEW COUNCIL—AUGUST 28, 1897.

The following members of the Council met at Hotel Lafayette at 9:30 a. m., for the purpose of organization: Messrs. Caspari, Dohme, Ford, Frost, Good, Hechler, Jacobs, Kennedy, Kremers, Mayo, Miller, Payne, Sheppard, Thompson and Whitney.

Temporary organization was effected by the election of H. M. Whitney as chairman and Geo. W. Kennedy as secretary.

The following permanent officers were nominated and elected: Chairman, W. S. Thompson; Vice-Chairman, J. M. Good; Secretary, Geo. W. Kennedy.

Committees to serve for the ensuing year were placed in nomination as follows and the Secretary instructed to cast an affirmative ballot for the nominees:

Committee on Membership: Wm. A. Frost, Chas. M. Ford, Geo. L. Hechler, James H. Beal, Geo. C. Bartells.

Committee on Finance: Chas. E. Dohme, Jos. P. Remington, Jacob A. Miller.

Committee on Publication: C. Lewis Diehl, Wm. J. M. Gordon, Edw. Kremers, Caswell A. Mayo, Chas. Caspari, Jr.

Committee on Transportation: Caswell A. Mayo, A. E. Ebert, Chas. M. Ford, L. F. Chalin, Wm. J. M. Gordon, Edw. Shumpik, Jos. Jacobs, S. A. D. Sheppard, Wm. M. Searby, H. M. Whelpley.

Committee on Centennial Fund, being specially provided for in the By-Laws of Council, was announced by the Chairman as follows: Henry M. Whitney, Chas. E. Dohme, Chas. Caspari, Jr.

The Chairman appointed the following *Auditing Committee* to serve for the current fiscal year: Jacob A. Miller, Chas. T. George, Edw. Z. Gross, all of Harrisburg, Pa.

After a recess of 10 minutes, the various committees announced their choice for chairmen as follows:

Committee on Membership: Wm. A. Frost, and also Geo. W. Kennedy as Secretary.

Committee on Finance: Chas. E. Dohme.

Committee on Publication: C. Lewis Diehl.

Committee on Transportation: Caswell A. Mayo.

Auditing Committee: Jacob A. Miller.

The proposed amendment to Art. I., Chap. IV., of the By-Laws of Council was, on motion of J. M. Good, seconded by S. A. D. Sheppard, adopted.

Henry P. Hynson, of Baltimore, was nominated for Local Secretary for the meeting of 1898 and elected by the Secretary casting an affirmative vote.

Geo. F. Payne and Henry P. Hynson were nominated and elected as additional members of the Committee on Membership, as provided for in the amendment to the By-Laws.

The Committee on Membership presented twenty-seven (27) names of applicants for membership, which, on motion of the Secretary, were directed to take the usual prescribed course.

The paper by F. E. Stewart, concerning the relations of physicians and pharmacists to each other and to the public at large, which had been referred to the Council by the Association, was, on account of its great importance, on motion of C. A. Mayo, duly seconded, referred back to the Association for discussion and action.

Geo. F. Payne made a statement in regard to the status of military apothecaries and the bills now before Congress, in charge of the Hon. Wm. Wilson of New York, and asked for an appropriation of one hundred (100) dollars.

On motion of Chas. E. Dohme, duly seconded, an appropriation of $75.00 was recommended to the Association for the use of Dr. Payne's committee, in addition to the sum of money already at their disposal.

On motion, Council adjourned.

GEO. W. KENNEDY, *Sec'y.*

On motion of Mr. Ryan, seconded by Mr. Ebert, the Council minutes were approved as read.

G. W. Kennedy read the names of twenty-seven applicants for membership, which were ordered to be posted in accordance with the By-Laws.

The Transportation Committee, through its chairman, Edw. Shumpik, presented the following report:

REPORT OF TRANSPORTATION COMMITTEE.

MINNETONKA BEACH, *August* 28, 1897.

The Committee on Transportation beg leave to report that after special effort involving the necessity of holding a meeting of the western members of the Committee at St. Louis on June 9th and 10th, a rate of one fare was made for the round trip to the place of meeting from all points within the territory of the Western Passenger Association. From all other parts of the United States a rate of one and one-third fares was made. For the first time in the history of the Association your committee succeeded in arranging to give to members outside the territory of the Western Passenger Association the benefit of the one-fare rate from the gate-ways, they paying one and one-third to those gate-ways. We are under obligations to the Wisconsin Central as being the first to make this special rate, which was later met by all the roads.

Some fifty members availed themselves of the excellent steamer service between Buffalo and Duluth, furnished by the Northwestern Steamship Company.

The Chicago, Milwaukee & St. Paul Railroad placed a special train at the disposal of the members coming via Chicago, and ran this train through on an exceptionally fast schedule. The officers and employees of this road deserve and have received the special thanks of the members for the courtesies shown.

E. SHUMPIK, *Chairman.*
ALBERT E. EBERT,
CASWELL A. MAYO,
CHAS. M. FORD,
S. A. D. SHEPPARD,
H. M. WHELPLEY.

Upon motion of Mr. Ebert, seconded by Mr. Hereth, the report took the usual course.

The report of the Committee on "Tax-free Alcohol" was read by Mr. Thompson, the Chairman of the Committee, as follows:

REPORT OF COMMITTEE ON "TAX-FREE ALCOHOL."

WASHINGTON, D. C., *July* 2, 1897.

To the American Pharm. Association:

Your Committee on "Tax-free Alcohol" have the honor to report that since our last meeting Congress has attempted no legislation affecting this question.

The Joint Committee of Congress provided for by Act approved June 3, 1896, has been investigating the use of tax-free alcohol in the arts and manufactures. Accompany-

ing the report submitted to Congress the Committee says, it has no positive recommendations in the way of legislation to make, and asks that the Committee be continued.

This Joint Committee held its meetings principally in New York City, where, it not being convenient for either member of your Committee to appear, advantage was taken of the appointment of Mr. George P. Engelhard to represent the Illinois and other Pharmaceutical Associations before the Joint Committee, to have him at the same time present to said Committee the frequently expressed opposition of the Association to tax-free alcohol. This voluntary duty Mr. Engelhard acceptably performed, as may be seen in the Joint Committee's printed report.

This report is a printed volume of 577 pp., containing many items of interest to pharmacy. Mr. Harry Dalley, Jr., was sent by the Congressional Committee to Europe to gather such reliable and accurate information as possible of the laws and regulations of foreign countries, which permit the use of tax-free alcohol in certain industries.

Mr. Dalley's report of his investigation is quite full, and from it we learn that in England, Germany, France, Switzerland, Italy, Sweden, Norway, Austria, Austria-Hungary and Belgium, the law permits the use of tax-free alcohol in certain industries and under legal restrictions.

In England Methylated Spirit (10 per cent.) is provided for the use of the bonded manufacturers, and after this spirit is "mineralized" by the addition of three-eighths of one per cent. petroleum, it is sold by licensed dealers in quantities not exceeding one gallon to any one. England has had such a law since 1855, and her officials say that frauds are scarce and diminishing.

In Germany methylization is done with two and one-half per cent. of a mixture of four parts wood alcohol and one part pyridine bases. Germany also provides for denaturalizing alcohol by the addition of some substance which renders the alcohol unfit for a beverage without impairing its use for the purpose intended.

Denaturalized alcohol is for manufacturing purposes. When to be used for certain alkaloids, ethers and chemicals, it is impregnated with half of one per cent. turpentine, 0.025 per cent. bone oil, and ten per cent. ether. For varnish, shellac is added. For aniline dyes 0.025 per cent. bone oil. This tax-exemption has the approval of the business people in both Germany and England.

In France the methylization is done with crude wood alcohol; and if for transportation, benzin and green malachite are added. For varnishes, resin is added; for ether, sulphuric acid.

In the other countries named the legal provisions are so similar to those already recited that it is unnecessary to here enumerate them.

At the public sittings of the Joint Committee opportunity was given to all to appear and present their wishes and reasons, either for or against the measure. It is worthy of note that among those appearing before the Committee there was not a single manufacturer of grain alcohol.

The opponents of the measure were the manufacturers of wood alcohol, who claimed their industry would be destroyed by the proposed measure; wood alcohol costing three times as much to produce as grain alcohol, and not as valuable as the latter for any purpose. One maker of charcoal iron opposed the measure for the reason that without the profit from the wood alcohol as a by-product in making his charcoal, he would be unable to compete with other makers of similar iron.

The National Paint, Oil and Varnish Association opposed the bill because it would encourage the consumption of cheap, inferior varnish, to the detriment of seller and consumer.

The American Phar. Association and several of the State Associations objected on grounds already familiar to the members of this Association.

Among those favoring tax-free alcohol were the National Wholesale Druggists' Asso-

ciation, Manufacturers of Proprietary Medicines, the Hat Manufacturers' Association, makers of shellac varnish, the makers of molasses alcohol, and makers of aniline dyes.

Among the facts elicited during the hearings were that a bushel of grain produces five (5) gallons of alcohol, and a cord of wood produces forty (40) bushels of charcoal, nine (9) gallons of wood alcohol, and two hundred (200) pounds of calcium acetate.

The Committee appeared quite anxious to learn from the experts before it if it were practicable to separate the wood alcohol from the grain alcohol in methylated spirit by distillation. While the opinions given and the experiments detailed were positively contradictory, your Committee are of opinion that the evidence was conclusive that the separation can be made by distillation so nearly complete as to permit the use of the recovered grain alcohol as a beverage. Several of the advocates of the measure submitted outlines of rules and regulations governing the use of tax-free alcohol; only one of them, however, provided for its use by the retail druggist.

W. S. THOMPSON,
JAMES M. GOOD,
C. S. N. HALLBERG.

Upon motion of Mr. Main, seconded by Mr. Stewart, the report was received and referred to the Publication Committee.

The report of the Committee on National Legislation was next called for and Mr. Stewart, the Chairman of the Committee, responded with the report as follows:

REPORT OF SPECIAL COMMITTEE ON NATIONAL LEGISLATION.

The subjects which have engaged the attention of your Committee during the past year have been the tax on alcohol, the retention of alcoholic beverages in the U. S. Pharmacopœia, and the question of patents and trade marks as applied to medicine. The Chairman of your Committee being also chairman of the delegation sent by the American Pharmaceutical Association to the meeting of the American Medical Association, recently held in Philadelphia, and also being a member of the executive committee of the latter body and of the Section on Materia Medica, Pharmacy and Therapeutics of the same association, has been very favorably situated to carry out the work of the committees representing the American Pharmaceutical Association.

The only new question of importance which has arisen in regard to alcohol legislation has been the proposed tax on wood spirits. An amendment was offered by Senator Lindsay, of Kentucky, during the closing hour of debate upon the Tariff Bill, placing an internal revenue tax upon wood spirits equal to that now levied on grain alcohol. This was defeated: but a few days later the project was again brought up and a tax equal to one-half that amount was proposed and defeated. The project was supposed to have been prompted by the grain alcohol interests. Although it is said that about six hundred telegrams were sent in protesting against the proposition, yet your Committee feels justified in assuming not a little of the credit for its defeat. The following facts explain the action of your Committee in the matter:

On Sunday, July 11th, Mr. A. E. Ebert, the secretary of your Committee, had a telegram from Washington, saying: "The Senate to-morrow will pass on an amendment to Tariff Bill, placing a tax on wood alcohol." Mr. Ebert at once got a list of the names of 81 Senators and sent to each one of them a night dispatch as follows: "Committee on Legislation of the American Pharmaceutical Association request you not to favor tax on wood alcohol, it being disadvantageous to retail druggists of the country. (Signed) Albert E. Ebert, Secretary of Committee." On the following Monday your Committee received word that the amendment had been defeated by a vote of 43 against 21. Tele-

grams and letters were also received from the Senators in which they expressed their views against such legislation.

The following report from Mr. Engelhard explains itself:

Dr. F. E. Stewart, Chairman Special Committee on National Legislation, American Pharmaceutical Association:

Dear Sir: Pursuant to your request and that of Messrs. Ebert and Thompson, that I represent your committee before the joint committee of the House and Senate on the alcohol tax, I beg to report that I appeared before the committee at its sessions in New York City, and was accorded an attentive hearing. The enclosed reprint copy of my address will indicate, I believe, that the views of your committee, as expressed in several conferences by its chairman and secretary, and by the spirit of the resolutions adopted by the American Pharmaceutical Association, were faithfully set forth.

The position of the Association, supported as it was by two score of State Pharmaceutical Associations, and opposed by none, exercised a most important if not decisive influence against a report by the joint congressional committee favorable to tax-free alcohol as proposed in pending legislation.

Yours very truly, (Signed) G. P. ENGELHARD.

Mr. Engelhard's address referred to in his report, names the associations, national and State, which he represented, quotes the resolutions on the subject of free alcohol passed by the American Pharmaceutical Association in 1894, and reaffirmed at its annual meetings in 1895 and 1896, draws the line between alcohol properly subject to taxation as a possible beverage and alcohol employed as a solvent or preservative in manufactures, refers to rebated alcohol, and then divides his subject into five general divisions, all with more or less diverse interests represented. Under these divisions the subject of tax-free alcohol is considered in relations to (1) Manufacturing Pharmacists; (2) Manufacturing Chemists; (3) Manufacturers of Proprietary Pharmaceuticals; (4) Manufacturers of Patent Medicines; (5) Retail Druggists. The conclusion finally drawn was that an equitable, non-discriminating law must either tax all natural alcohol or tax none.

The association will remember that the question of retaining alcoholic beverages in the Pharmacopœia was referred to the Section on Materia Medica, Pharmacy and Therapeutics of the American Medical Association. Acting as a member of the Executive Committee of that section, your chairman wrote to a number of prominent physicians asking for papers on the subject. The secretary of your Committee, at the suggestion of the chairman, called on N. S. Davis, M. D., LL. D., the veteran founder of the American Medical Association, for a paper. Dr. Davis has been a student of the alcohol question for many years, and is in a position to speak with authority. He kindly consented to read a paper, which, on its presentation, excited much discussion. Although there were opposing views expressed, yet the Section unanimously recommended that "Spiritus Frumenti and Spiritus Vini Gallici be dropped from the United States Pharmacopœia." That the action of your Committee in this connection has excited general interest is shown by the fact that a large number of the medical and pharmaceutical journals have commented on Dr. Davis' paper, and the New York State Pharmaceutical Association in its report of the Committee on Pharmacy and Queries cordially expressed approval of our action.

In pursuance of the work of your Committee in this connection, a circular letter was sent by the chairman of the delegation to all its members, asking for information and opinions on the subject. These letters were responded to by several prominent delegates reporting results of investigation and opinions founded thereon. These letters will be found in the report of the delegation to the American Medical Association.

The matter contained in the report of your Committee last year relative to patents and trade marks attracted the attention of pharmacists in several sections of the country, and resulted in the reception of a number of applications for further information, which were cheerfully complied with.

One of the cases in which your Committee supplied information was that of the Cen-

taur Company *vs.* Heinsfurter & Daggett. The patent having expired for Pitcher's Castoria, the firm referred to placed it on the market under its commonly accepted title, namely, "Pitcher's Castoria." For this they were enjoined by the Centaur Company, but the court refused to make the injunction permanent on the ground that the patent having expired for "Pitcher's Castoria," the public may manufacture and deal in it under that name. A very interesting article explaining their position was published by Heinsfurter & Daggett in the New Idea.

Your Committee desires to call attention to a recent decision of the United States Supreme Court bearing on the question of the use of names as trade marks which of necessity have become the proper appellations of well-known articles of commerce. The case alluded to is that in which the United States Supreme Court decided that as the patent has expired for that special kind of a sewing machine known by the name "Singer," the public has a right to manufacture the Singer sewing machine and deal in it under that name so long as proper care is taken not to deceive the public in regard to the source of manufacture. While all have the right to make the Singer sewing machine, no one has the right to mislead the public in relation to who manufactures the machine. No one has the right to say the Singer sewing machine manufactured by the Singer Manufacturing Co. except the Singer Manufacturing Co. No one has the right to say Pitcher's Castoria is manufactured by the Centaur Co. except the Centaur Co.

In this connection, we beg to quote from Browne on Trade Marks, section 240: "It requires nice discrimination to determine what falls within the category of fancy names. When a new preparation or compound is offered for sale, a distinctive and specific name must necessarily be given to it; and that name, no matter when or by whom imposed, becomes by use its proper appellation, and passes as such into our common language. Hence, all who have an equal right to make and sell the article have an equal right to designate and sell it by its proper name, the name by which alone it is distinguished and known, provided each person is careful to sell the article as prepared or made by himself, and not by another. When this caution is used, there is no deception of which a rival manufacturer, not even he by whom the distinctive name was first invented or adopted, can justly complain. So far from there being any imposition upon the public thereby, it is the use of the distinctive name that gives to purchasers the very information which they are entitled to have. In short, an exclusive right to use on a label the appropriate name of a manufactured article exists only in him who has an exclusive property in the article itself."

Another ground which would throw out a great many of the so-called trade marks is that of fraud. It is well-known that fraud vitiates every contract in law. Those who wish to defend their trade marks must come into court with clean hands. If a person should mix together several well-known drugs and give the mixture a coined name and register the same as a trade mark, he could not protect his alleged trade mark in the courts if he were guilty of fraud. If, for example, he should call his aggregation a new coal tar synthetic when it was not, he would be guilty of fraud. Furthermore, he would be between the horns of a dilemma, for every new thing must have a name belonging to it as its descriptive title, so that without patenting the article the person would have no right to restrain either the article itself or its name from common use. On the other hand, if the name was deceptive, it could not be defended as a trade mark. Again, "once a trade mark always a trade mark." In other words, such names as "Singer Sewing Machine," "Pitcher's Castoria," the "telephone," the "phonograph," etc., if accepted as trade marks in the beginning, and used as such, must remain trade marks after the patents for the articles commonly known by these names expire, and so their monopoly would be retained more or less indefinitely just to the extent that the public was unable to ascertain how to make them. The courts have therefore wisely decided that such names, being the only recognizable titles for these articles, are not trade marks.

The president of the New York State Pharmaceutical Association recommended that the American Pharmaceutical Association be urged to memorialize Congress in favor of limiting the protection to foreign-made medicines and chemicals to such protection as they may enjoy where made. This recommendation was approved by the committee on the president's address, and your committee would unite in urging this association to the action suggested. It was also suggested by President Smithers and approved by the committee, that the committee on commercial interests ascertain if foreign-made copyrighted or patented chemicals or medicines can be legally imported and sold, duty paid, under their chemical names. It seems to your committee that it would be very desirable to ascertain the truth in this connection, but it appears to be one of interpretation of law which can only be secured by a decision of the Supreme Court in each individual instance. But your committee suggests that so long as the United States patent laws are so constructed that when a patent for a foreign article expires in a foreign land it also expires in the United States, it certainly would appear that it is not the intention of this government to protect other than its own interests.

The object of the patent law is to promote progress in science and the useful arts. The object of applying the patent law to medicine is to promote progress in the science of medicine and in the useful arts of preparing medicine and applying the same to the cure of the sick. Conversely, it is not the object of the patent law to protect those who are engaged in deceiving the public by exaggerating the therapeutic value of alleged new remedies. If the patent law could be so applied to medicine as to foster original investigation in drugs and medicines and in their application to the cure of disease, the most ethical physician in the land would not object to it. Neither would there be any objections from honest manufacturing houses seeking to know the truth, the whole truth, and nothing but the truth, concerning the new products which they are introducing. What all honest men should object to is the abuse of our patent and trade-mark laws by which medical and pharmacal quackery is made to triumph over the legitimate practice of medicine and pharmacy. Under the proper application of these laws, fraud could not find existence. Your committee, therefore, favors a careful study of the patent and trade-mark laws as applied to medicine, and their revision, if necessary, in such a manner that the actual discoverers of new and useful processes or machinery, or other appliances for the manufacture of medicine, shall be rewarded, original investigation be promoted, the business of the pharmacist and physician be protected and favored, and kept from competition with charlatanism and quackery, and the public health be saved from the machinations of those who under the guise of law are attempting to substitute a dishonest commercial business for the practice of the educated and trained physician and pharmacist.

The object of the trade-mark laws is to protect the public from fraudulent substitution of one brand of goods for another brand of the same article. This is accomplished in the iron trade by branding some peculiar mark on the iron from one firm to distinguish it from the iron of another firm. That mark may be a peculiar design, or a coined word. But the proper name of the article cannot be employed as a trade mark. The word iron is common property, and a part of the common language. Trade marks may be employed in medicine to distinguish between various brands of the same medicine; but it is entirely unnecessary to do so, as the label, in each instance, serves the same purpose. A medicine is recognized by its name, just as iron is recognized; and every medicine must have a name by which it may be recognizable. The name of a medicine or of a medicinal compound is just as much common property, and part of the language, as the name iron. Every new thing born into the world must have a name given it under which it may be manufactured and dealt in; and that name belongs to the article itself, and not to the person naming the article. When an article is withheld from general use for a limited time by a patent, its name is restricted for the time being. But it is only

restricted, not withheld from use entirely, for the public has the right to use it in describing the article, the trade has the right to use it in ordering the article from the manufacturer, and lexicographers and literateurs have a right to employ it as describing the article in their writings: therefore, the name, being the title which the public has a right to use in referring to the article, is necessarily descriptive, and cannot be a trade mark. It makes no difference whether it is a coined name, arbitrarily chosen, or not, if it is used to distinguish the article from other articles, it is the name of the article which it describes. A trade mark must be employed to distinguish between different brands of the same article. A word which distinguishes one kind of a thing from another is not a trade mark. That is sound law and sound common sense.

It is admitted that a coined name may be used as a trade mark to distinguish one brand of a medicine, or medicinal compound, from another. The word "Tsi" may be used by Powers & Weightman to distinguish between the quinine made by that firm and the quinine made by some other firm, provided it accompanies the descriptive word quinine on the label. The word "Tsi" used in connection with quinine in this way would not mean quinine, but it would mean Powers & Weightman, and being a trade mark, could be used by that firm as a commercial signature on other goods of its manufacture, as well as quinine. The word could also be employed by other firms to serve as a trade mark on other classes of goods. For example, a lion branded on iron by a manufacturer of iron cannot prevent the manufacturer of tin from branding a lion on tin; neither can the word "Vaseline" be so restrained from general use by the manufacturers of petroleum jelly that it cannot be branded on tooth-brushes, or cough candy, by the manufacturers of those commodities.

But what your committee objects to is the employment of so-called trade-mark names to distinguish between kinds rather than different brands of the same things. Furthermore, as the label of each brand of medicine is sufficient to distinguish it from other brands of the same article, and both manufacturers and the public are sufficiently protected under the statutes of fraud, your committee respectfully suggests whether it would not be far better to adopt the names now claimed as trade marks when applied to medicines not furnished with proper designations as titles for the same, or give them titles compatible with scientific nomenclature and adopt the so-called trade-mark names as synonyms. If the trade could be forced to limit its use of coined and fanciful names to their legitimate employment as trade marks, there might be no reason to complain; but manufacturers are forcing the public and the profession to use their trade-mark names as proper titles by not giving their preparations other names which may be free to the use of all, and thus creating very unfair and lasting monopolies in the manufacture and sale of medicines, which, not being patented, are free for all to manufacture and sell. Take the word "Vaseline" as an example. It is claimed as a trade mark on petroleum jelly; but the manufacturers have been very strenuous in their efforts to have "Vaseline" employed as a title for petroleum jelly in place of the proper title, which they have purposely kept back as far as they have considered it safe to do so, and still lay claim to the exclusive use of the word "Vaseline" as a trade mark. They have been so successful in this that among the thousands who prescribe or employ the article there are few who would recognize it if it were referred to in conversation as petroleum jelly. The word "Vaseline" has gone into the common language as a title for a well-known commodity, on account of the immense amount of money spent by the manufacturers in the education of the profession and the public to use it, not as a trade mark, but as a descriptive title. The object of the manufacturers has been, not to employ the word "Vaseline" for the purpose of distinguishing their brand of petroleum jelly from other brands of the same article, but to obtain a monopoly in petroleum jelly itself by educating the people to call it "Vaseline." Under the title "Vaseline" it has been incorporated in our medical literature, so that text-books, formularies and medical journals are advertising the

monopolized product of the manufacturer. They have turned every man, woman and child who employs it into a gratuitous advertiser of their product. We believe in protecting the manufacturer in the right to the exclusive use of his own brand mark in distinguishing his goods; but we do not believe in the granting of monopolies in articles of commerce to individuals or concerns, with the exception of the limited monopolies granted to inventors as a reward to them for the 'publication of full knowledge of their discoveries whereby those skilled in the art may freely practice them when the patents expire.

The following resolutions, in addition to the resolutions by the New York State Pharmaceutical Association already alluded to above, have been referred to your Committee, and are therefore appended as part of this report.

The Committee of the Pennsylvania Pharmaceutical Association on the "co-operation with the Medical Society of the State of Pennsylvania for the abolition of protective copyright laws when applied to certain much-used chemicals," recommended the adoption of the following resolution by the Pennsylvania Pharmaceutical Association:

Resolved, That the Pennsylvania Pharmaceutical Association heartily endorse this effort and will assist the State Medical Society in every way possible.

Resolved, That this body, through a Committee, bring the subject before the American Pharmaceutical Association at its next annual meeting, with a view of enlisting the combined efforts of the pharmacists throughout the land.

Resolved, That a report of this action be sent to the Medical Society of the State.

F. W. E. Stedem,
J. H. Redsecker,
L. Emanuel,
Committee.

Resolutions from the Minnesota State Pharmaceutical Association:

Whereas, It is customary for this Government to grant a trade-mark or copyright to manufacturers in foreign countries, where said articles are not protected by copyright or trade-mark, thus restricting competition in the manufacture of said articles; therefore be it

Resolved, By the members of the Minnesota State Pharmaceutical Association, that they do earnestly urge the Committee on Legislation of the American Pharmaceutical Association to see that a bill be drafted and presented to Congress, prohibiting the future granting of such copyright or trade-mark on goods manufactured in foreign countries and not protected in the country where manufactured, and thus remove the excessive cost on such goods in this country.

F. E. Stewart, *Chairman, for the Committee.*

Upon motion of Mr. Ryan, seconded by Mr. Hereth, the report was received and referred to the Publication Committee.

The report on Beneficiary Features was called for, and Mr. Hallberg, the Chairman of the Committee, presented the following report:

REPORT ON BENEFICIARY FEATURES.

To the American Pharmaceutical Association:

The Committee appointed by resolution at the 44th annual meeting to report upon the feasibility of establishing beneficiary features in conjunction with membership in the Association, presents the following account of such features in some of the oldest associations of pharmacists in European countries. Reports were received from the following countries:

Great Britian—The Pharmaceutical Society; communicated by Mr. J. Humphreys sub-editor of the Pharmaceutical Journal, London.

Germany—Deutscher Apotheker Verein, Oesterreicher Apotheker Verein, Bairischer Apotheker Verein; communicated by Dr. Fredk. Hoffman, Leipzig.

Sweden—Apotekare Foreningen; communicated by Bl. Lindman, editor Farmaceutisk Tidskrift, Stockholm.

The Committee did not obtain reports from France and Belgium, where these institutions are said to especially flourish.

GREAT BRITAIN.

The Pharmaceutical Society Benevolent Fund amounts to $100,000, from which are paid annuities to 45 persons of about $10,000 and casualty relief last year of about $3,000.

The Benevolent Fund, which was one of the objects for which the Pharmaceutical Society was founded, has afforded assistance to many deserving persons. By the Pharmacy Act of 1868, power was vested in the Council to grant aid, not only to Members and Associates for the time being, but *to all persons who have been registered as Pharmaceutical Chemists or Chemists and Druggists, whether connected with the Society or not.*

By the Charter of Incorporation, power is given to the Council to transfer money from the General to the Benevolent Fund; and for this reason, in framing the code of regulations, it has been expressly provided that every Member and Associate shall have a voice in the election of annuitants. In the years 1842, 1843, and 1844, three several sums, of £500 each, were so transferred. In those years, the annual subscription to the Society from a Member was two guineas, instead of one as at present; that from an Associate, a guinea, in the place of half a guinea. The reduction of the amount of these subscriptions for a time precluded a further augmentation of the Benevolent Fund from that source; but the sums already granted having been invested in Consols, formed the foundation of a fund to which the Council has added from time to time the unexpended income arising from interest, donations, and annual contributions, and by a further transfer of £500 from the General Fund in 1870. In the year 1848, a public dinner was held, which yielded over £800 to this Fund; and at the still more successful meetings in 1867, 1877, and 1887, larger amounts were subscribed, and it is hoped that the decennial meeting to be held this year, 1897, will result in even greater benefit to the Fund. The ordinary annual contributions, which in 1860 were £491 *1s.*, have risen to over £1,710 in 1896, this latter amount being exclusive of Donations received during that year. The capital, part of which is invested in Freehold Ground Rents, has now reached the sum of £28,647 *2s.* *5d.*

There were, in addition to the forty-seven annuitants, over fifty cases in which assistance was given last year; and when it is remembered that most of the applicants had families looking to them for partial or entire support, the number of persons benefited must be taken as greater than these figures indicate.

This is a result which might fairly be anticipated. In a young Society there are few members needing relief. Many changes in worldly condition have taken place since the Fund was commenced more than 50 years ago, and each year an addition may be expected to the number of applicants, more especially as, by the legislation of 1868, already mentioned, the number of persons having a claim upon the Fund is at least *quadrupled. Each year should therefore bring its increase of contributions from those whose exertions in business are rewarded by success.* The Benevolent Fund of the Pharmaceutical Society stands somewhat in the position of an *Insurance Fund,* from which all hope that it may not be their lot to seek assistance, but by an unfortunate course of events many of the most prosperous have been only too glad to accept temporary or permanent relief from it.

All genuine cases of necessity presented to the Council are aided by temporary assistance. In 1865 the system of granting Annuities was commenced; two of £30 each were then given; the amount was in 1878 increased to £35, and in 1891 the Council raised the amount to £50 per annum. A smaller amount is granted to annuitants under 65 years of age, according to approved regulations. At the present time no less than forty-five annuitants are in the enjoyment of an adequate fixed income from the Fund.

All contributors of half a crown and upwards to the Fund have votes in the election of annuitants (see regulations of the Fund).

In order, however, to continue these annual elections, it is desirable that the invested capital should be increased sufficiently to insure from its interest enough to provide means for these grants, which, when once given, cannot be recalled; and it is important that it should be generally known that the interest of the £28,647 *is insufficient to pay the present increased annuities*, now amounting to £2,295.

As a further reason for urging this, it is well to draw attention to the fact that the system of granting sums in casual cases involves a considerable expenditure, amounting in 1896 to over £560. The publication of such grants naturally brings further applications, which the Council will be unable to entertain if too large a proportion of the annual subscriptions be absorbed in the payment of Annuities.

At the recent festival dinner the donations realized $10,000 for the Benevolent Fund.

GERMANY.

As is well known, pharmacy and the number of pharmacies are restricted in most continental countries. This limitation indirectly also restricts the number of persons entering upon and employed in pharmacy. A certain percentage of those who by education and study attain to the license of conducting a pharmacy, for want of capital never become owners of such. They serve, unless they enter upon some kindred trade or profession, for lifetime as clerks or as administrators. Some of these, or of former owners, come by old age or by misfortune into conditions when they, or upon their death their widows, are in need of assistance for support. Now for this class of deserving invalids of the trade, and for their widows, the national pharmaceutical associations in Germany and Austria have established and accumulated since many years pension funds (Unterstützung-Kassen). These funds amounted with the German "Apotheker Verein" in 1896: General fund for support and charities, Mk. 53,981; fund for pension and support of invalidated clerks or their widows, Mk. 127,481; fund for the support of deserving university students of pharmacy, Mk. 17,892.

These funds have accumulated by voluntary contributions, by obligatory payment of a small amount by each apothecary when accepting a new apprentice, by small annual contributions of pharmacy owners as well as of clerks, and finally by legacies. Besides, there are in Germany, and particularly in Austria, special associations of drug-clerks combining science and recreation with the special aim and object of accumulating funds for support of deserving sick or invalidated members or of their widows, either by temporary donations or by regular pensions.

There are also funds as well as a number of special legacies entrusted to the care of the national associations for assisting young talented pharmacists in the perfection of their education and post-graduate university study.

Germany and Austria and similar continental countries have a legally restricted number of pharmaceutical personelle which can readily be supervised and controlled; these benevolent side issues and institutions of the National or State Associations in Pharmacy and Medicine can easily be conducted and applied.

But would this be possible in any satisfactory degree in a country of the magnitude of the United States of America, and, moreover, in view of the indefinite and the uncontrollably excessive number of persons of all grades and kinds engaged in and annually entering upon the almost unlimited domain of the drug-trade?

Those are problems about which I do not dare to express an opinion. The exercise of charity in America and by Americans is as great and as noble as in any other civilized country, and the American Pharmaceutical Association, if it should enter upon the additional domain of establishing beneficiary features, may find means and ways of organizing, conducting and applying such on correct principles and methods, and upon a proper and enduring basis.

Should you desire any further information or copy of statutes of such beneficiary side

issues of continental Pharmaceutical Associations, it will always afford me a pleasure to serve you or the American Pharmaceutical Association in any form or capacity I may be able to do. But in this instance, and on account of the fundamental difference between the condition of pharmacy here and with you, such statutes would be of little practical account to your noble aims and efforts.

I trust that the annual meeting of the American Pharmaceutical Association at Minnetonka will be a pleasant and sociable one to its participants, and a productive and sustaining one to both the Association and to American pharmacy. The American Pharmaceutical Association should cease to walk in the modest path of an admirer and follower of other National Associations; it is ripe and potent enough to march in the front, and to become a leader and a power among them.

My thoughts and my heart will, during the days of your meeting, be with the many dear and old friends in the blessed great country across the Atlantic, for whom I shall retain for lifetime my affectionate allegiance and friendship.

FRED. HOFFMAN.

SWEDEN.

There are in Sweden two associations: (1) The Apothecaries' Society; (2) The Pharmaceutical Association.

To the Pharmaceutical Association, organized about 1850, are eligible for membership all pharmacists, *i. e.*, registered assistants, clerks, and also apothecaries who operate pharmacies.

The Apothecaries' Society is composed exclusively of pharmacists who have the privilege of conducting a pharmacy.

This Society exercises the functions, through the Government, of regulating the practice of pharmacy and its general commercial interests. Also to improve the status of pharmacy by elevating the educational requirements and qualifications, fostering education as in the establishment of the "Farmaceutiska Institutet," awarding "stipendia" for post-graduate studies in universities, domestic and foreign, and providing for pension and relief for the widows and children of deceased pharmacists.

Every "apotek" is assessed a certain annual fee, in proportion to its value, for the treasury of the Society. The Society, moreover, administers donations received from wealthy pharmacists; this fund amounts to nearly 50,000 Kr. ($15,000).

Private subscriptions are frequently made for the care of pharmacists incapacitated from work through illness. During the present year several "stipendia" have been awarded to traveling students, including a delegate to the International Pharmaceutical Congress in Brussels, The delegate, Mr. Danielson, to the International Pharmaceutical Congress at the World's Fair, Chicago, was also a beneficiary. At the 1896 meeting of the Pharmaceutical Society the following sums were voted:

Farmaceutisk Tidning	400 Kr.
Pharmacists' families dependent	400 "
Traveling stipendium	500 "
Pharmacist post-graduate studies	400 "

A total of 500 dollars for a Society which represents only 300 pharmacists.

The Committee recommends that a committee be appointed to present a working plan to the Association at its next annual meeting; provided, that a sum, not to exceed 50 dollars, be appropriated to engage the services of an expert in insurance to formulate a practicable and legally-proof plan.

Respectfully submitted, C. S. N. HALLBERG, *Chairman.*
CHAS. M. FORD.

Lake Minnetonka, Aug. 24th, 1897.

Upon motion of Mr. Thompson, seconded by Mr. Main, the report was received and referred to the Committee on Publication.

It was moved by Mr. Alpers, seconded by Mr. Ryan, that the recommendations of the Committee be adopted, and that the Committee be continued in order to present a plan in accordance with their own recommendation.

The motion was amended by Mr. Thompson so as to strike out the appropriation of $50, which amendment was seconded by several.

MR. HALLBERG: I wish to say that the Committee is not desirous one way or another, but the Committee believes it has collected all the information that is available on this subject; that to continue the Committee in order to do further work in this matter would involve the elaboration of a perfect plan, and as far as I am concerned, I would not undertake to formulate anything of that kind. That requires a man who is thoroughly familiar with all the laws on subjects of that kind in the various states.

Upon motion of Mr. Thompson, seconded by Mr. Ebert, the motion was laid on the table.

The report of the Committee on Meeting in 1900 was called for and the chairman, Mr. Alpers, said: "Mr. President, this Committee is not ready to submit any kind of a plan at this time, as it is too far in advance to make any kind of an arrangement or get any concessions, or get any definite answer from the transportation companies. What we have done is the following, and we beg to submit the same:

REPORT OF THE COMMITTEE ON THE MEETING IN 1900.

Your Committee respectfully report that they have made inquiries about the feasibility of holding the meeting of the American Pharmaceutical Association in 1900 aboard a transatlantic steamer, with the following result:

1. No steamship line is at present willing to make any definite arrangement or fix a price for the passage in 1900.

2. The general impression of all passenger-agents of the various steamship lines is that the price in 1900 will not be higher than now.

3. By engaging all the cabins of a regular transatlantic steamer, we will be able to accommodate about 3co passengers.

4. There is no reasonable doubt that the expense of going to and coming back from Paris will not exceed $100, the price ranging from $90 to $125, according to location of rooms, etc.

5. It appears to your Committee that the Hamburg-American Steamship Company is the most desirable line to select for this proposed trip, as arrangements can probably be made with them to return with any of their steamers, starting either from Hamburg, in Germany, or Plymouth, in England, or Cherbourg, in France, or Naples, in Italy; thus giving all those who wish to extend the trip to the various parts of Europe the opportunity of returning at the least possible expense.

WILLIAM C. ALPERS,
ALBERT E. EBERT,
CASWELL A. MAYO,
H. M. WHELPLEY.

Upon motion of Mr. Stewart, seconded by Mr. Thompson, it was voted that the report be received and the committee continued.

Upon motion of Mr. Stewart, seconded by Mr. Ebert, it was voted that the Special Committee on National Legislation be continued and its personnel be left to the President of this Association, and that the number be increased to seven.

The Secretary, at the request of Mr. Ryan, the chairman, read the following report of the Committee on Weights and Measures:

REPORT OF THE SPECIAL COMMITTEE ON WEIGHTS AND MEASURES.

To the President and Members of the American Pharmaceutical Association :

The report presented by the Chairman of this Committee at the meeting held in Montreal expressed a hope that some substantial progress might be made in the adoption of the Metric System of weights and measures in this country during the year to come.

The members of this Association who have followed the proceedings of Congress for the past year will readily understand why this work has not been accomplished, or any material advancement made in it.

At the first session of the 54th Congress the Metric Bill was passed by a very small majority, and then, upon reconsideration of the vote, the bill was referred back to the Committee on Coinage, Weights and Measures, where it still remains.

The second and shorter session of the same Congress was occupied with the consideration of subjects of greater interest to the members, and it was not thought wise to bring the matter forward.

At the special session of the 55th Congress, recently closed, the consideration of such a measure would have been impossible; consequently the past year has been one altogether unfavorable to securing any definite action upon the Bill in question.

Hon. C. W. Stone, Chairman of the House Committee on Coinage, Weights and Measures in the 54th Congress, has been continued in the same position in the present Congress, and, I am informed, will take the first available opportunity to bring the matter forward for consideration. It is very gratifying to those favoring the adoption of the Metric Bill to have so earnest a supporter of the measure at the head of this Committee.

During the past year a number of interesting reports have been made by Consuls representing the United States in foreign countries now using the Metric System, as to the methods employed and inconvenience experienced in the change from their customary systems. These reports, although not at present available, will be used as additional arguments for the adoption of the Metric System in this country.

On account of the large number of changes in the membership of both the Senate and the House of Representatives, caused by the election of last year, it will be necessary for the members of your Committee, and all others interested, to do some active work whenever it is thought wise to bring the subject forward for consideration.

Many of the new members, as well as some of the old, will have to be convinced of the advantages to be gained by making the Metric System the legal system in this country.

Although there has been very little that your Committee could do during the past year, the members thereof are ready to take active interest in the matter whenever there appears to be an opportunity for securing favorable consideration of the subject.

Respectfully submitted, F. G. RYAN,
Lake Minnetonka, Minn., August 23, 1897. *Chairman.*

On motion by Mr. Kennedy, seconded by Mr. Sheppard, the report was received and referred for publication, and the Committee continued.

The report of the Committee on Status of the Pharmacists in the United States Army, Navy and Marine Hospital Service was here read by Mr. Payne.

REPORT OF THE SPECIAL COMMITTEE ON THE STATUS OF PHARMACISTS IN THE UNITED STATES ARMY, NAVY AND MARINE HOSPITAL SERVICE.

Mr. President and Fellow Members of the American Pharmaceutical Association:

Your special Committee on the Status of Pharmacists in the United States Army, Navy and Marine Hospital Service beg leave to make the following report:

In our report made at our last meeting at Montreal in 1896, we gave copies of the three bills which were drawn up by this Committee and introduced in the House and Senate of the 54th Congress. These bills were most warmly advocated not only by the pharmacists of our Association, but by the profession generally throughout the United States. That they received adverse reports from the departments to which they were submitted was due not only to the fact that departments dislike to have changes requested by outsiders, but also that some of our work and pressure was brought to bear too late for it to have proper weight. There seemed to be an idea among some pharmacists that it would be impossible to get our bills acted upon at all, and, as prompt action was secured, this caused a delay in the forwarding of the letters of a number of pharmacists until after action had been taken by the departments unfavorable to our wishes.

At the short session during the past winter our chairman went to Washington at his own expense, to see what were the chances of our accomplishing anything at that time. He found Congress perfectly willing to vote upon our bills favorably if they were not reported adversely by the departments, but it was found impossible to get the departments to reconsider their reports. This brought us to the special session of the 55th Congress, with the usual great changes among those in authority. We sought diligently for a favorable opening, but day after day passed without the appointment of committees until we found that we could secure no action upon bills of the character we represented during this session, and that the best we could do would be to introduce the bills so that they might be taken up upon the convening of the regular session. Towards the close of this special session our chairman again made a trip to Washington at his own expense, to see that our bills were properly introduced as soon as it was decided who would constitute the various committees. Our three bills were taken in charge and introduced by Hon. F. H. Wilson, of New York, who is one of the members of the Committee on Naval Affairs. He assured us he would do all in his power to secure their passage, and is no doubt much interested in helping the pharmacists of the United States in their efforts to secure proper official recognition. Mr. Foraker, of Ohio, also agreed to introduce our bills in the Senate as soon as they left the House. The bills as introduced are identical in wording with the three bills presented a year ago, except in the case of the bill bearing upon the army hospital stewards, which had the following words added to section VII: "And all Acting Hospital Stewards shall be given the rank and pay of Hospital Stewards and shall be entered in the order of their admission to the service." It may be advisable to withdraw this bill of the army hospital stewards and make a simpler one, asking only for an advance in pay, and retirement on three-quarter pay after a proper term of service, the general impression being that if the pay is advanced to $75.00 per month for the hospital stewards that the step even to a commission would be an easy one. Our bill was drawn up upon consultation with several hospital stewards in regard to the matter, but by more thorough inquiry and investigation we think it would be advisable to make this change, and are now investigating the subject, as the War Department would be much more likely to approve such bill. The army hospital stewards seem

somewhat slow to express themselves, feeling bound down by the rules of their branch of the service. As this matter is not a political one in any sense, we do not see how they can so regard it; but discipline and order are very important in military affairs, and the army hospital steward may feel that he is doing wrong to do a little independent thinking. Naturally, however, they are all heartily in favor of any advancement.

We have been corresponding with the hospital stewards of the National Guard throughout the United States, and find them very ready to help us. We have secured lists of their names from most of the states and are making efforts to secure the names of them all, as we find them very ready indeed to join us in our work. As the organization of the medical corps of the National Guard is founded upon that of the United States army, hospital stewards of the National Guard naturally desire an advance of status for the army hospital stewards, feeling that they should have the rank and dignity accorded to them which is given in nearly all other civilized countries.

Our three bills are now before the House of Representatives, and as Congress convenes the first week in December it is incumbent upon us to prepare ourselves so that our greatest efforts may be put forward during the first portion of December. Your Committee desires to appeal to as many pharmacists and prominent persons as possible throughout the United States to assist us in securing favorable action upon our bills. This will involve the printing of considerable matter, and the writing of many letters. In fact, to reach every pharmacist in the country would require many thousand dollars. It is not practical to reach them all, but certainly we should be able to reach a very large number. To do this with economy we must begin to write our letters and get ready at as early a date as possible, as to different classes of men different letters must be sent. Last year we secured the hearty co-operation of the presidents and secretaries of the pharmaceutical associations, pharmaceutical periodicals, members of the Boards of Pharmacy, wholesale druggists, and the various committees appointed by the pharmaceutical associations in each state, and many others. We believe that the medical profession would be most willing to help us in this excellent work for professional advancement, but we are not pecuniarily able to reach the pharmacists alone as should be done, much as we would like to appeal to our sister profession.

We believe we are much more certain of success with the army bill if we modify it so as only to ask for increased pay, as suggested above, using this as a stepping-stone for advanced rank in the future. Such a bill would meet with less opposition and would produce less change in the service. The bill for the marine hospital stewards would also be easier to pass if modified somewhat in the same way. In regard to the naval bill, we feel that matters are in most excellent shape for its passage just as its stands. It has been most highly endorsed and recommended by the present surgeon-general, Dr. J. Rufus Tryon, who embodies it almost verbatim in his recommendations in his annual report. We also understand that Dr. Bates, who may succeed Dr. Tryon, is favorably inclined toward us. Hon. Jno. B. Long, Secretary of the Navy, we are also led to believe, will not oppose a legal status such as we request being given to the naval apothecaries. This makes the outlook most hopeful for the naval bill, and with proper energy and push we believe it possible to pass even all three bills just as they are. To accomplish any of this work, however, requires persistent energy and push on the part of all. Almost every one has continued to respond in a most energetic and warm-hearted manner to every call which has been made upon them, and as a committee we unite in thanking the pharmacists throughout the United States for their hearty co-operation in this work which has been given in our charge.

The committee has not found it necessary to call upon the treasurer of the Association for any of the sum of $50 voted to its use at our last meeting in Montreal. The reasons for this were various. One reason was that voluntary subscriptions were adequate to cover the actual expenses incurred, and seek as we might we could find no opportunity

favorable enough to warrant us in making our culminating battle. We made much favorable progress at the last regular session, and have fought to hold our position and be ready at the first favorable opening to put forth a mighty effort. Another reason that our Association appropriation has not been called upon is on account of our chairman preferring not to use for his trips to Washington any of the money contributed. In this way the American Pharmaceutical Association appropriation has remained unexpended.

The following voluntary contributions to our cause have been made since our Montreal meeting last year:

Cr.

By Eli Lilly, Indianapolis,	$10 00
" Parke, Davis & Co., Detroit,	25 00
" Wm. McIntyre, Philadelphia,	5 00
" The Piso Co., Warren, Pa.,	25 00
" sundry parties interested in the Naval Bill,	210 00
" " " " " " Army Bill,	50 00
" " " " " " Marine Hospital Bill,	30 00
Total,	$355 00

Dr.

To Stamps,	$58 90
" Stenographer,	121 50
" Typewriter,	80 00
" Carbon paper,	25
" Copies of papers purchased to send public men,	2 50
Balance on hand of unexpended contributions,	91 85
Total,	$355 00

We close this present year with a balance of $91.85 on hand, not including the A. Ph. A. appropriation. We would have used every cent at our command if the proper opening had occurred, and would have badly needed a far larger sum. Conditions are now most favorable for a vigorous and winning fight in December, and we wish to put forth every effort possible, and desire funds to get matters into shape ready for the December effort. Thousands of letters must be written, and such work is expensive when properly done. We desire to thank most heartily our leading pharmaceutical journals for their ever ready and hearty co-operation, and those wholesale manufacturers who have so gallantly come to our assistance, and all others who have aided us in any way.

The pharmacists in the service of the United States Government appreciate our labors, and so highly esteem the work of our Association, as led by our special committee, that 43 of these gentlemen have recently joined our organization, and have all paid their dues in advance.

The following excerpt from one of their letters to us illustrates their position in this matter: "I do not anticipate that this movement will effect any additional working energy as far as the Association is concerned (it would certainly be *impossible* to display more disinterested labor and interest in us than that of yourself and your Committee), but I trust and believe that it will concentrate the efforts of the 'boys' themselves in pnshing the cause along, not counting the personal benefit they will necessarily derive by coming into the fold."

Much work is necessary this fall for properly informing those who are to exercise their influence in behalf of our bills. During the next few months the services of a skillful stenographer and typewriter are an absolnte necessity to enable our chairman to keep up an organized and harmonious effort among the committee and those pharmacists and their friends throughout the United States who are interested in our work. We have created a most favorable and far-reaching impressiou, and our outlook to-day is far more encouraging than it has ever been.

Respectfully submitted, GEORGE F. PAYNE, *Chairman.*

(Applause.)

MR. MAIN: I move that the report be received and referred to the Committee on Publication, with an especial vote of thanks to the Chairman of the Committee; also that the Committee be continued. I think none of us, except those who have served on legislative committees, can have an idea of the amount of labor necessary in a thing of this kind, and Dr. Payne has attended to his labors faithfully, we all know.

The motion was seconded by Mr. Thompson, and prevailed.

The Chairman of the Council here read his report on the invested funds of the Association.

REPORT OF THE CHAIRMAN OF THE COUNCIL ON THE FUNDS OF THE ASSOCIATION.

The investments and cash belonging to the several funds of the Association in possession of the Chairman of the Council at the close of the fiscal year, June 30, 1897, consist of:

Ebert Fund.

U. S. Registered 4 per cent. bond, No. 160,603	$100 00	
" " " " " 67,880	500 00	
" " " " " 2,125	100 00	
		$700 00
Cash in bank at last report	30 12	
Received during year for interest and bank dividends	29 07	
June 30, 1896. Balance in Strafford Savings Bank, Dover, N. H.		59 19

Centennial Fund.

U. S. Registered 4 per cent. bond, No. 145,640	$1,000 00	
" " " " " 160,604	100 00	
" " " " " 2,126	100 00	
" " " " " 2,127	100 00	
		$1,300 00
Cash in bank at last report	60 88	
Received during year from interest and bank dividend	53 95	
	$114 83	
Oct. 7, 1896. Paid for material for investigation	22 33	
June 30, 1897. Balance in Strafford Savings' Bank, Dover, N. H.		92 50

Life Membership Fund.

Ten (10) U. S. Registered 4 per cent. bonds, each for $1,000. (Nos. 145,639, 145,761, 145,762, 150,826, 150,827, 150,828, 164,185, 164,889, 173,049, 185,893.)		$10,000 00
Cash in bank at last report	$321 90	
Received during year for interest and bank dividend	411 53	
Received during year for Life Membership fee	10 00	
June 30, 1897. Balance in Strafford Savings' Bank, Dover, N. H.		743 43

General Fund.

Three (3) American Security & Trust Co's 5 per cent. debenture bonds, Nos. 26, 27 and 28, each for $1,000		$3,000 00

On July 1st, the above bonds were redeemed, and six (6) 4 per cent. bonds of the same company, each for $500, taken at par and accrued interest.

All the above securities are given at their face value only. All interest paid to date.

W. S. THOMPSON, *Chairman of Council.*

On motion of Mr. Ebert, seconded by Mr. Stewart, the report was accepted.

On motion of Mr. Kennedy, seconded by Mr. Sheppard, it was voted that the Local Secretary for next year be made Chairman of the Committee on Arrangements, with authority to appoint the other members of the committee.

The report of the delegates to the National Wholesale Druggists' Association having been called for, Mr. Main responded as follows:

Mr. President, I regret that I am not able to present a written report at this time, but I will in a few words state that the committee was represented at the meeting of the National Wholesale Druggists' Association, and were received as kindly as we usually are. We also solicited and obtained the aid of the legislative committee of that body to further the work undertaken by this Association for the advancement of the status of pharmacists before the army and navy. I will, if it meets with the wishes of this Association, submit my report later in writing.

Upon motion of Mr. Thompson, seconded by Mr. Dohme, it was agreed that the chairman of the committee be allowed to submit his report in writing direct to the Secretary, for publication.

(The following report was subsequently received from the chairman of the Committee:)

To the President and Members of the American Pharmaceutical Association:

Gentlemen: The Twenty-second Annual Meeting of the National Wholesale Druggists' Association was held at the Hotel Walton in the City of Philadelphia on October 5th to 8th, 1896, and was attended by over three hundred members and delegates.

Our Association was fully represented, as all members of the delegation were in attendance.

Shortly after the opening of the first session your delegates were recognized and accorded the privileges of the floor. In addressing the meeting fraternal greetings were conveyed from our Association, and the wholesale body was congratulated upon the good work accomplished for its members during the year, occasion being taken when touching on the rebate plan to remind the wholesale trade that the protective plan for selling proprietary medicines would never be perfect until some measure of protection was accorded to the large army of distributors, of which so many are represented in our American Pharmaceutical Association.

The aid of the Wholesale Association was invoked in the work being prosecuted by one of our special committees for securing better professional recognition for pharmacists serving in the U. S. Army and Navy, and our efforts in this direction resulted in the passage of the following resolution:

"*Resolved*, That the Association heartily endorses the effort being made by the American Pharmaceutical Association to secure better professional recognition for pharmacists in the U. S. Army and Navy, and that the legislative committee be instructed to actively aid the special committee of the American Pharmaceutical Association to secure the passage of the bills introduced into both branches of the National Legislature for that purpose."

Your delegates were received in the most cordial manner by the officers and members of the Wholesale Association and were afforded ample opportunity to express their views on matters under discussion, and we feel warranted in the belief that the American

Pharmaceutical Association can confidently rely upon the active assistance of the Wholesale Body in furthering all projects of mutual interest to their respective memberships.

Respectfully submitted,

THOS. F. MAIN,
RICHARD M. SHOEMAKER,
WILLIAM MCINTYRE,
JOHN F. PATTON,
GEO. L. MUTH.

THE PRESIDENT: The next is the report of the Committee on Time of Next Meeting. The report of this committee was referred to the last session, as far as time was concerned.

MR. DOHME: Mr. President and Gentlemen, the committee have no special report to make. They seem to have agreed that it would be best to meet the last Monday in August, which will give us the first week in September for our meeting—a very favorable time for the purpose.

Upon motion of Mr. Main, seconded by Mr. Thompson, the report was received and the recommendations adopted.

The report of the delegates to the American Medical Association was called for, and Mr. Stewart, the chairman, submitted the following report:

REPORT OF THE DELEGATION TO THE AMERICAN MEDICAL ASSOCIATION.

The following subjects were referred to the Section on Materia Medica, Pharmacy, and Therapeutics, of the American Medical Association, by this body at its last annnal meeting held in the city of Montreal:

Liquor Selling in the Drug Stores. This was the subject of a paper read before the American Pharmaceutical Association last year by Mr. H. M. Whitney, of Massachusetts. The paper was referred to the Section, and became part of the matter influencing the decision in relation to dismissing certain alcoholic beverages from the Pharmacopœia.

The following Sections from the Report of the Committee on Revision of the United States Pharmacopœia were also referred to the Section: "15. Dismiss Spiritus Frumenti and Spiritus Vini Gallici from the United States Pharmacopœia. 16. Dismiss Vinum Rubrum and Vinum Album from the United States Pharmacopœia. 17. Dismiss all tinctures having a fluid extract of the same drug official, and all fluid extracts having a tincture of the same drug official, and substitute for such tinctures and fluid extracts, 50 per cent. tinctures under a distinctive title. 22. Return to Potassium Sulfate as a diluent in making Dover's Powder, in place of Sugar of Milk, used since 1880."

After debate, the Section on Materia Medica, Pharmacy and Therapeutics passed the following resolution by unanimous consent:

"*Resolved,* That the Section on Materia Medica, Pharmacy and Therapeutics recommends that Spiritus Frumenti and Spiritus Vini Gallici be dropped from the United States Pharmacopœia. The Section is also in favor of restoring the old formula for Dover's Powder. As regards the other subjects referred, the Section does not concur in the recommendations expressed."

In pursuance with the work of the delegation the chairman sent a letter to each of the thirty-one members composing it, asking for the expression of their views relative to the subjects under consideration. In response to this letter, the chairman received several valuable contributions from Mr. R. W. Williams, Three Rivers, P. Q., Canada, Prof. L. E. Sayre, University of Kansas, and Mr. William S. Thompson, of Washington, D. C. Mr. Thompson having interviewed the Surgeons-General of the Army, Navy and Marine

Hospital Department and others in government employ, submitted letters from these officials.

Recognizing the necessity of securing harmonious relations between physicians and pharmacists, the delegation took advantage of this opportunity to present to the American Medical Association a certain document entitled "Preamble and Resolutions," which consists of a number of paragraphs describing the present situation, followed by resolutions of a reformatory nature, concerning the relations of physicians and pharmacists to each other and to the public at large. This document was originally devised by the chairman of your committee, and afterwards modified and corrected by one of its members, Prof. J. U. Lloyd, who has long made a study of the ethical relations of the professions a subject of conscientious work. That part of the paper relating to patents and trade marks seeks to be in conformity to the patent and trade mark laws as they now read, and as they are interpreted by the Supreme Court of the United States. It is not pretended that the authors of the document are in entire harmony with each other, or with the views expressed in the document itself. Said document was not devised to teach any one's views, but rather to bring up for debate subjects of vital importance which are exciting the interest of physicians and pharmacists all over the world.

It was the intent of the chairman of your delegation to have had the points debated by the Section on Materia Medica, Pharmacy and Therapeutics, of the American Medical Association, hoping that it would be the best manner of bringing the subject to the attention of the profession. But upon mature consideration, it was decided that it would be better for your chairman, as a member of the Executive Committee of the American Medical Association, to take the document directly to headquarters. Accordingly, the matter was brought up at a meeting of the Executive Committee, and a committee of three was by it appointed to examine the document for the purpose of recommending proper action thereon. The following is a report of the Committee of Three:

REPORT OF COMMITTEE OF THREE TO WHOM PREAMBLE AND RESOLUTIONS SUBMITTED BY DELEGATION OF A. PH. A. WAS REFERRED BY THE EXECUTIVE COMMITTEE OF THE A. M. A.

A delegation of pharmacists representing the American Pharmaceutical Association having presented through its chairman, F. E. Stewart, M. D., Ph. G., a certain document to the Executive Committee of the American Medical Association, which contains matters concerning the relations of physicians and pharmacists to each other, and to the public at large: said delegation having explained that said document does not recommend the voice of the American Pharmaceutical Association as a body, but only contains the views of a few of its prominent members; said delegation having also explained that it is not the desire of its members to force the discussion of the matter forming the subject of the document upon the American Medical Association, but rather to ascertain whether such discussion would be considered appropriate and agreeable to said Association, and would tend to promote friendly relations between the professions of medicine and pharmacy on lines of progress in medical science and in the useful arts of pharmacy and therapy, and benefit suffering humanity, does request the consideratiou of said Executive Committee as to the appropriateness of presenting the document to the American Medical Association; and, in case the project is favorably regarded, said delegation snggests that said document be referred back to the American Pharmaceutical Association, to be presented thereto by the accredited delegate of the American Medical Association, that it may form a subject of debate at the next annual meeting of said Pharmaceutical Association, to be held at Lake Minnetonka, Minn., August 23, 1897; and, after such debate, it is hoped by the delegation that the national association of pharmacists may return said document to the Executive Committee of the national association of physicians so changed or modified that it may express the voice of the pharmacists represented by said Association in relation to the important points referred to. Your committee, having examined said document, recommends that the suggestions made by the delegation from the American Pharmaceutical Association in regard to its disposal be adopted, and that said document be referred back to said Association for debate with the hearty approval of the Executive Committee of the effort now being made to harmonize the relations between the professions of medicine and pharmacy on the lines suggested, and to cultivate fraternal relations between physicians and pharmacists.

Signed, F. E. STEWART, *Chairman of Committee.*

The report of the Committee of Three was unanimously adopted, together with the

suggestions contained therein, and your chairman was appointed a delegate to the American Pharmaceutical Association with proper credentials, to present the document referred to to your honorable body for debate.

In connection with this document, the chairman of your Committee read a paper before the Section on Materia Medica, etc., entitled: "Is it Ethical for Medical Men to Patent Medical Inventions?" This paper was received with distinguished consideration and favorably discussed by John V. Shoemaker, M. D., LL. D., professor of Materia Medica in the Medico-Chirurgical College of Philadelphia; Professor Joseph P. Remington, of the Philadelphia College of Pharmacy; Professor Robert G. Eccles, Editor of the American Medical and Surgical Bulletin, and Dr. E. H. Squibb.

The Committee on Joint Investigation, suggested by Professor H. H. Rusby last year, deserves great credit for its excellent work on Strophanthus. The following papers were submitted in connection with the work of the Committee: *a.* Comparative Investigation of the Varieties of Commercial Strophanthus; Smith Ely Jelliffe, New York, N. Y. *b.* Composition; Alfred R. L. Dohme, Baltimore, Md. *c.* Physiologic and Therapeutic Action; a Clinical Study; R. W. Wilcox, New York, N. Y. The Pharmacology of Strophanthus; E. M. Houghton, Detroit, Mich.

It is to be regretted that Dr. Rusby, the chairman of the Committee of Joint Investigation, was not able to be present at the meeting of the Section to take part in its deliberations.

An interesting and important paper entitled, "Plea for Uniformity in Diastase Tests," was read by Dr. C. C. Fite, of New York City, and a committee was appointed, consisting of Drs. C. C. Fite and F. E. Stewart, for the purpose of bringing the subject to the attention of a committee for revising the United States Pharmacopœia. A paper was read by Professor William Trelease, of St. Louis, director of the St. Louis Botanical Gardens, entitled "Medical Botany," which is worthy of special mention as it opens the door to physicians and pharmacists for special botanical work.

A number of valuable contributions on drugs were read, including "Celandine: its pharmacology, physiologic action and therapy," by J. V. Shoemaker; "The Constituents of Viburnum Bark," by Professor Coblentz, of the New York College of Pharmacy; "Guaiacol Valerianate and Creosote Valerianate," by Professor Frank Woodbury, of Philadelphia, Pa.; "Carvacrol Iodid," by Dr. A. Cohn, of Milwaukee, Wis.; "Thyroid Extract," by Dr. W. H. Neilson, of Milwaukee, Wis.; "The Nature of the Leucocytosis Produced by Nucleinic Acid," and "A Preliminary Experimental Study," by Drs. A. A. Huntley and Delano Ames, of Baltimore, Md.; "Nuclein Solution," by Oscar R. Tomlinson, M. D., of Mt. Vernon, N. Y.; "The Effects of Serum and Special Antitoxins in Pure and Mixed Cases of Tuberculosis," by Dr. Paul Paquin, of St. Louis. Mo.; "Antistreptococcic Serum, a Clinical Study," by Dr. Harold Sorby, of Chicago, Ills.; "The Serum Therapy of Tetanus," by Dr. A. F. Lempke, of Hospital, Ills.; "Treatment of Mental States by Toxins," by Dr. O. A. King, of Lake Geneva, Wis.; "Some Recent Observations in the Use of Antitoxins," by Dr. Alexander McAllister, of Camden, N. J.; "Personal Experience with the Use of Antitoxin in the Treatment of Diptheria," by Dr. J. Newton Snively, of Philadelphia, Pa.; "Discussion," by Dr. Dillon Brown, of New York, N. Y.

The drift of these papers pointed out very clearly that the future of professional pharmacy is greatly dependent upon physiological therapy. There is more and more a tendency to substitute the more exact methods of the chemical and physiologial laboratory, together with carefully observed clinical experience, for the empirism which has characterized medical practice during the past. In this work the professional pharmacist can greatly aid the scientific physician by furnishing him with the results of original research in his own department. Joint work and co-operative investigation by physicians and pharmacists will gradually raise our knowledge of drugs to the dignity of a science. The

demand for medicinal agents on the part of the medical profession will be created in the future by scientific literature instead of misleading advertisements. Trade methods will become of less and less importance to pharmacists who practice pure pharmacy. Pharmacy will be defined as the science and art of preparing medicines for their application to the treatment of the sick by competent physicians, instead of being considered in the light of a commercial business run in competition with the medical profession and in opposition to rational therapeutics.

In connection with the work of the Delegation on the subject of patents and trade marks, Dr. Chas. Rice, Chemist of the Department of Public Charities, New York City, and Chairman of the Committee for revising the United States Pharmacopœia, submitted a report on the use of so-called proprietary medicines as therapeutic agents, adopted by the Medical Board of Bellevue Hospital, and approved by the Board of Commissioners of Public Charities, together with a letter explaining the scope of the report by the author.

Respectfully submitted, F. E. STEWART, *Chairman.*

THE SECRETARY: Mr. President, there are three amendments to the by-laws here which have been properly presented at the previous sessions and are now up for final action by the Association. The first amendment before us is that of Mr. Hallberg to amend Article III., Chapter V. of the By-Laws treating of the Report on the Progress of Pharmacy. Strike out in the 3d and 4th lines the words, "On the changes in conditions of pharmaceutical institutions."

Upon motion of Mr. Mayo, seconded by Mr. Kennedy, the amendment was adopted.

THE SECRETARY: The second amendment, proposed by Mr. Sheppard, is Article IV., of Chapter V., by adding thereto the following words: "An introduction or synopsis of the report to be presented to the Section on Scientific Papers." The object is to take the report out of the General Session and place it in the Scientific Section, to which it is referred each year, and thus save a great deal of time in the General Session.

Upon motion of Mr. Ebert, seconded by Mr. Alpers, the amendment was adopted.

The next amendment proposed is by Mr. Hallberg. In Articles V. and VI., Chapter IX., strike out the words, "within six months after," and insert therefor "at the next."

Upon motion by Mr. Ebert, duly seconded by Mr. Stewart, the amendment was adopted.

The Secretary read a telegram received from the South Carolina Pharmaceutical Association.

COLUMBIA, S. C., *August* 25, 1897.

To CHAS. CASPARI, JR., *Sec'y. Amer. Pharm. Assoc., Hotel Lafayette:*

Accept best wishes from South Carolina druggists, with regrets for our absence; can promise good attendance next year in Baltimore.

O. E. THOMAS, *Prest. South Carolina Pharm. Assoc.*

Also a statement from Prof. J. U. Lloyd regarding the Lloyd Library.

THE LLOYD LIBRARY.

At the Denver meeting of the American Pharmaceutical Association a resolution was drawn up by Mr. S. A. D. Sheppard and unanimously adopted, whereby the stored volumes of the Society were transferred to the above named library. This reference was probably the first intimation the majority of members had concerning the library under consideration, and a few remarks on the subject are certainly due at this time.

The Secretary of the Association, Prof. Caspari, in accordance with the resolution, boxed and shipped the books to Cincinnatti. On examination they were found to consist of about three hundred bound volumes, and a number of unbound volumes and pamphlets.

A feature of this extremely valuable donation is the collection of broken sets of pharmaceutical, chemical and philosophical journals, such as for example:

The Calendar of the Pharmaceutical Society of Great Britain, 9 volumes.

Calendar of the Pharmaceutical Society of Ireland, 9 volumes.

Journal of the Chemical Society, about 9 complete volumes, and about ten volumes less complete.

Philosophical Society of Glasgow, about 21 complete volumes.

Liebig's Annalen, about 13 complete volumes.

Archiv der Pharmacie, about 13 complete volumes, and a great number of broken volumes.

Fresenius Zeitschrift d. analyt. Chem., 8 complete volumes.

Nachrichten der K. Gessellsch. der Wissensch. in Göttingen, about 23 complete volumes.

Sitzungsber. d. Bayr. Academie, 16 complete volumes.

Pharm. Zeitschrift für Russland, 8 volumes bound.

Journal de Pharmacie et de Chimie, many broken volumes.

Pharmacopœia of India, 1868.
" Helvetica, 1872.
" Norvegica, 1870.
" Suecica, 1869.

Broken volumes of American Journal of Medical Sciences, Transactions of the Academy of Sciences of St. Louis, Proceedings of Pharmaceutical State Associations, and many more that need not be now enumerated.

Some of these volumes supplied missing serials of the Lloyd Library, for example, gaps in the Chemist and Druggist, 1892, American Chemist, 1875 and 1876.

Even so seemingly remote a publication as the "Sitzungsberichte der Bayr. Academie der Wissenschaften of 1866" proved useful in an instance where a scientific inquiry regarding the behavior of starch has reached the Lloyd Library.

Remarks.—The Lloyd Library was established originally by J. U. and C. G. Lloyd, purely as a means of self-culture and self instruction. When we attempted to issue a complete history of the North American medicinal plants, under the title of "Drugs and Medicines of North America," we were surprised to find that so many books of reference were missing as to make it impossible for us to credit the undertaking. Consequently the publication was interrupted, and until recently we scarcely felt well enough equipped to continue, but probably within a year or two will be in a position to proceed. However, within the last few years the attempt we are making in the line of a pharmaceutical and botanical library has attracted much attention from men who have reason to consult this library or apply to us for references or information concerning subjects embraced in its literature. The demand in this direction has been such as to consume much of the time of an accomplished scientific librarian, and Dr. Sigmond Waldbott has consequently devoted his time largely to the library. It became evident that the collection should no

longer be considered personal, and hence, with a view to its future usefulness, the plant is ultimately to find its final resting-place in some active educational institution. In the meantime, while under our control, whoever desires assistance is free to consult its contents and to draw upon us for reference notes.

We take great pleasure in referring to two conspicuous donations received during the past year. One, from *Mr. A. E. Ebert*, of 84 volumes, among which may be named:

4 volumes of Ure's Dictionary of Arts, etc.,
10 " Liebig's Poggendorff, etc., Handwarterbuch der Chemie,
5 " Berzelius, Lehrbuch der Chemie,
2 " H. Rose, Handbuch de analyt. chemie,
1 " H. Hager, Manuale pharaceuticum,
2 " Knapp's Chemical Technology,
2 " Muspratt's Chemistry,
1 " The Chemist's Manual, Henry Mott, 1877,
2 " The Pharmacist, Chicago, 1868 and 1869,
1 " Rother, The Chemistry of Pharmacy, Detroit, 1889,

and many more valuable works too numerous to mention here.

The other from *The Western Druggist*, of Chicago, through *Mr. G. P. Englehard.* A complete set of the *Chemisches Centralblatt*, 1830 to 1896, for which we were authorized to pay the price, one hundred and ten dollars.

Besides these, many gifts of single volumes and of odd pharmaceutical journals have been received from the friends of pharmaceutical education, and it may be added that any book or pamphlet connected with pharmacy has a place in this collection.

In extending our personal thanks in a public way to this society and others who have encouraged us to continue in a work that can no longer be called personal, it is needless for us to say that we also voice the thanks of the many students and professional workers who now consult its contents. JOHN URI LLOYD.

Upon motion of Mr. Stewart, seconded by Mr. Beal, both communications were referred to the Publication Committee.

THE SECRETARY: We have two communications from the Section on Pharmaceutical Education and Legislation. The first requests that the Association shall have printed for distribution by the Section 500 extra copies of the Report on a Model Pharmacy Law.

On motion of Mr. Sheppard, seconded by Mr. Ebert, the request was acceded to.

THE SECRETARY: The second request from the same Section is that the Association print 500 copies of the paper on the discovery of ether anæsthesia, presented by Mr. Joseph Jacobs, for distribution.

Upon motion of Mr. Whelpley, seconded by Mr. Alpers, the request was granted.

MR. ALPERS: I have a resolution which I proposed at the third session of the Section on Education and Legislation this morning, and which was referred to the last general session; it reads as follows:

Resolved, That, in accordance with the recommendation of the Chairman of the Scientific Section, a committee of five be appointed during the coming year by the President-elect, for the purpose of taking action to give pharmacy its due recognition and representation in the proposed National Department of Health, and that the President of

the Association and the Chairman of the Section on Legislation be members of this Committee ex-officio.

Upon motion of Mr. Ebert, seconded by Mr. Thompson, the resolution was adopted.

Upon motion of Mr. Sheppard, seconded by Mr. Kennedy, it was voted that the Local Secretary, Mr. Edward Shumpik, be empowered to call meetings and act as presiding officer during the week of the social sessions immediately following the business sessions.

Upon motion of Mr. Kennedy, seconded by Mr. Main, the twenty-seven applicants whose names were proposed in the early part of the session were invited to complete their membership.

THE SECRETARY: Mr. President, we have here a matter which was referred to the Council at the second session, and has been referred back to the Association by the Council. Very few of the members outside of the Council are familiar with this document, which the Council thought was a matter of such importance that they did not desire to take definite action on it, and therefore referred it back to the Association for the purpose of having it discussed at the general session, as particularly referring to the retail drug trade. It is the Preamble and Resolutions offered by the delegates appointed to visit the American Medical Association, and is supposed to voice the sentiments of the American Pharmaceutical Association. It was received by the American Medical Association and referred to the Executive Committee of that body, who added some recommendations and suggestions to it and then referred it back here for discussion, after which it is to go back to the American Medical Association for proper action. It will be necessary, in order that all the members may understand it, to read the document.

MR. STEWART: I would suggest that the preamble be read and that the resolutions be taken up seriatim, and acted on in that way. By so doing we will save a great deal of time.

The Secretary read the preamble and resolutions in the manner suggested. After full discussion by Messrs. Ebert, Mayo, Thompson, Bartells, Beal, Sheppard, Whelpley, Hemm and Stewart, the same were finally adopted to read as follows:

PREAMBLE AND RESOLUTIONS.

To the American Medical Association: We, a delegation of pharmacists, representing every section of the United States, being appointed by the American Pharmaceutical Association to attend the meeting of the American Medical Association in Philadelphia, the first Tuesday in June, 1897, do herewith present to your honorable body the following preamble and resolutions, hoping that your honorable body will indorse the same that it may express the sense of the National Medical and Pharmaceutical Societies in relation to matters of mutual interest to the professions of medicine and pharmacy.

1. WHEREAS, Secrecy in regard to the origin, nature, composition and methods of preparing medicine is a hindrance to science, in that it conceals knowledge and presents an open door to fraud,

2. *And Whereas*, Monopolies in medical products enable medical monopolists to create a fictitious demand for the same by advertising the favorable side only, and suppressing anything that might injure sales,

3. *And Whereas*, Such a method of advertising gives undue importance to medical novelties,

4. *And Whereas,* Secrecy and monopoly and misleading methods of advertising are contrary to beneficence and professional liberality,

5. *And Whereas,* Pharmacy, or the science and art of preparing medicine, is part of medical science and practice, and physicians are dependent upon pharmacists for the selection, preparation, and standardization of medicine; for the publication of the knowledge of drugs and the methods of preparing them for therapeutic use; for the establishment of medicinal preparations in scientific forms that the knowledge therof may be intelligible to future generations, and form part of medical literature, and take its place in text books for the instruction of students about to enter the professions of medicine and pharmacy and thus form part of what is known as the science of medicine,

6. *And Whereas,* The United States Pharmacopœia, being devoted to the drugs and preparations used by physicians in treating the sick with directions for preparing the same, should contain a list of the newer drugs and preparations introduced to the Materia Medica, with processes for preparing them, and standards for their excellence and purity,

7. *And Whereas,* Many of the articles advertised in the medical and pharmaceutical journals claiming to be true pharmaceutical preparations are not admitted into the United States Pharmacopœia, though some of them are of sufficient value to be made official, for the reason that their only names are claimed as private property, and their constituents are not divnlged,

8. *And Whereas,* The composition or origin of many of these articles are trade secrets, a danger threatens medical literature, for without a knowledge of their drug composition pharmacopœial reference to them as remedies for the treatment of disease is meaningless from a scientific standpoint; therefore, be it

1. *Resolved,* That we, as representing the profession of pharmacy, do hereby express our condemnation of secrecy and monopoly in medical products, and at the same time express our desire that the medical profession shall unite with the profession of pharmacy in raising the standard of professional and scientific requirements, so that the practice of pharmacy shall be maintained at its true position as a part of medical science and practice, hoping that by so doing the time may soon come when physicians and pharmacists may work together in harmony in promoting progress in the knowledge of medicine, and in the application of medical agents to the relief of human suffering. We do hereby accept the definition of a secret remedy given by the official Medical Board of Saxony: "Secret remedies are all those agents sold for the prevention and cure of disease of man and animals, of which the ingredients, percentage composition, and method of preparation are not made public when first announced for sale. Such information must be complete and exact, in readily comprehensible language, and made known to all desirous of such information." And be it

2. *Resolved,* That we request that all manufacturers of pharmaceutical preparations shall comply with scientific and professional requirements; shall throw open every medical product to legitimate competition; shall publish the working formulæ for all medicinal preparations or compounds, except as hereinafter provided; shall give to each preparation on the market when first introduced a name under which all may manufacture and deal in it, such name to be appropriate and descriptive of the article to which it is applied, and compatible with scientific nomenclature; and shall furnish the Committee of Revision of the United States Pharmacopœia, if requested, with the composition of each secret or semi-secret combination, so that the article described, if found worthy, may be made official in the Pharmacopœia; and be it

3. *Resolved,* That we recognize the commercial element in pharmacy which requires that capital invested in the manufacture of medicine should receive legitimate protection, provided it is employed in accordance with beneficence and not used for the purpose of misleading the public by lying advertisements and catering to self-medication to the in-

jury of the public health; therefore, while not sanctioning the patenting of medicinal products themselves, we do sanction the patenting of machinery and processes for manufacturing medicines, provided that they are really new and useful inventions, and providing the applications for patents are not drawn up in such a manner as to create monopolies in the products themselves, so that others cannot manufacture them by other machinery and by the use of other processes. By this we mean to say that all medical products should be open to free competition; and as the Supreme Court would not sustain the patent of Prof. Morse because the application was so drawn up as not only to protect him in the use of his machinery and apparatus, but to give him a monopoly in the transmission of messages by electricity and thus to hinder progress in the development of a most valuable discovery, so that the court should not sustain any patent which will create a monopoly in the manufacture and sale of a medicinal agent or composition of matter used in the relief of human suffering; and be it

4. *Resolved*, That it is our purpose to do away with the use of fanciful words employed as titles for medicinal preparations to the confusion of medical nomenclature, and replace the same by legitimate trade marks, or marks of trade used as commercial signatures to distinguish between two or more brands of the same article as manufactured by various firms; and be it

5. *Resolved*, That sufficient pharmacy should be taught in our medical colleges to enable students entering the practice of medicine to discriminate between persons engaged in the legitimate practice of that art. and those pretenders practicing pharmacal quackery; and that sufficient knowledge of physiology and therapy should be taught in pharmaceutical colleges to enlarge the scope of knowledge of pharmacentical students, so that they may afterwards realize the responsibility of their own vocation, limit their practice to its proper sphere, and not trench on the prerogatives of physicians, that the medical and pharmaceutical professions may hereafter work in harmony for the purpose of promoting knowledge in medical science in all its departments, raising the standard of education in both professions, and furnishing the public with a higher class of medical and pharmacal service; and be it

6. *Resolved*, That the United States Pharmacopœia should be made a text-book in medical as well as pharmaceutical colleges, that physicians and pharmacists should be urged to provide themselves with copies of that work, that both professions should be urged to take more interest in its decennial revision, sending accredited delegates from medical and pharmaceutical societies thoroughly instructed as representatives to the convention for revising the Pharmacopœia, and that the increased revenue derived by the committee on revision from the larger demand for the Pharmacopœia thus engendered, be devoted to improving that work by means of original investigation and other methods that may be suggested.

MR. STEWART: Mr. President, I now move that the resolutions as revised be referred to the American Medical Association.

The motion was duly seconded and prevailed.

MR. WHELPLEY: The American Pharmaceutical Association is certainly fortunate in having a member who is not only in position, but will take the time and trouble to further the interests of both the medical and pharmaceutical professions, as Dr. Stewart has done in this report; and I believe it is due to Dr. Stewart to vote him a special expression of thanks for his labors in this connection.

MR. EBERT: I second that motion.

MR. KENNEDY: I desire to say that Dr. Stewart has labored 15 years to accomplish what he has presented to the Association to-day.

The motion was put and prevailed.

THE SECRETARY: I wish to move that a delegation of five members, to be appointed by the incoming president, be sent to the National Wholesale Druggists' Association.

The motion was seconded by Mr. Kennedy and prevailed.

Mr. Whelpley moved the following vote of thanks, which was carried unanimously:

Resolved, That our most grateful acknowledgement be expressed to the ladies and the local committee of arrangements, the local secretary, and others of our friends who have aided in making the 45th annual meeting of the American Pharmaceutical Association, held at Lake Minnetonka, Minn., a success and our visit here so very agreeable.

MR. FROST: Mr. President and Gentlemen, you will remember when the delegation from this state went to Denver to have the Association meet with us last year, and again last year went to Montreal to have you meet with us this year, we made promises that we have tried to fulfill, and it is more gratification to us to realize that we have fulfilled those promises than it is to you to feel that you have enjoyed them; and this meeting is one that we will remember with the very greatest of pleasure, and we hope it will stir up an interest in this section of the country in the American Pharmaceutical Association, and that this section will always be well represented at the coming meetings, which I believe will be the case. I do not think in the future you will look around to find a delegation from Minnesota and find it wanting. (Applause.)

THE PRESIDENT: The next business before the meeting is the installation of new officers, and I would suggest that we take a recess of five minutes, so the people who are outside will have an opportunity to come in.

After a recess of five minutes, the President appointed ex-President Ebert, of Illinois, and Mr. Tilden, of Massachusetts, to act as a committee to conduct the newly-elected officers to the platform.

MR. EBERT: Mr. President, we have the pleasure of presenting to you Mr. Whitney, the newly-elected President of the Association.

(All in attendance arose.)

THE PRESIDENT: It gives me very great pleasure indeed, Mr. Whitney, to install you as President of the American Pharmaceutical Association. Those who are here who may not know you personally are very well acquainted with you by reputation, for I doubt if there is any man in the United States who has made himself more prominent in the interests of pharmacy, not only in the state of Massachusetts, but also in the interests of pharmacy throughout the country, than you have; and I think it is a very fitting compliment to your efforts that on this, the anniversary of your fortieth year of membership in the American Pharmaceutical Association, you should have been elected as President of this body. In attaching this pin I know that you will carry on the traditions which have been so characteristic of the men who have gone before us, and uphold the honor of the American Pharmaceutical Association and of pharmacy in this country. (Prolonged applause.)

MR. WHITNEY: Mr. President, and Ladies and Gentlemen, I shall endeavor to be very brief in what I have to say at this time, because I wish to give ample opportunity to the

First and Second Vice-Presidents, who are better and more able speakers than myself. In order that I might not repeat myself and occupy more time than desirable, I have put partly upon paper what I have to say. I trust you will all be seated.

Mr. President, for the kind words you have spoken, accept my grateful thanks, and to you, sir, permit me to tender my congratulations in conducting one of, if not the most satisfactory meetings we have ever held.

All the sessions have been well attended, partly if not mainly due to your example and influence.

To you, fellow members, for your helpful and kindly greeting, words at my command cannot do justice to my feelings.

Surprises come to all of us: two notable ones have come to me. The first at the Profile House, which some of you may remember. My second notable surprise is the call to preside over this Association at its next annual meeting in Baltimore in 1898.

Mr. President, to follow you, and so good a man as your immediate predecessor, Prof. Good, and the many loyal men preceding, is to me appalling. I certainly should not have the courage to assume this responsibility were it not for the kind and able assistance I feel I shall receive at the hands of our Secretaries, Messrs. Caspari and Kennedy. And also the good Sheppard, who always watches over and tenderly cares for every lamb of the American Pharmaceutical Association, will, I am sure, have such watchful care of me that I cannot go far astray.

While I fully appreciate the personal compliment and high honor, I as fully recognize that my election is a special recognition of the old Bay State and her board of pharmacy.

Perhaps I ought to give you some idea of the make-up of the State Board you have thus honored. It is often spoken of as representing the wheel of a carriage. The country member is the outside rim, the past and present secretaries the main spokes, the member from Boston of course represents the Hub, and is the orator of the board, the President is the little nut whose office is to try to keep the wheel in place. Had you selected Mr. Tilden, the orator of our board, you would have had a pyrotechnical display of sky-rockets, bombs, and mines, instead of the few simple words I can say.

The work accomplished by the several Sections and the general Sessions, it seems to me, marks a year of special progress and value. I am sure these annual meetings of the American Pharmaceutical Association are to all of us something in the line of a life-giving elixir, keeping us young in spite of age. For who so young as one of our oldest members who regularly takes his "annual smile?" In this case, the person to whom I refer as illustrating my point has the additional advantage of a contented mind, a generous, sympathetic, unselfish nature. His pilgrimage through life to this point has been alone, and while one of many precious gems might have been gathered by him, he has resolutely given way to others. That he may never be too old to cheer us by his genial presence is my most earnest wish. In order that this just tribute may not be misapplied, I will add that the member to whom I refer hails form York, on the banks of the mighty Codorus.

Again thanking you and hoping I shall not disappoint you, I accept the position to which you have called me.

THE PRESIDENT: The next installation will be that of the First Vice-President, Mr. Geo. C. Bartells, of Camp Point, Ill.

MR. EBERT: Mr. President, we have the pleasure of introducing to you Mr. Geo. C. Bartells, our newly elected First Vice-President. (Applause.)

THE PRESIDENT: Fellow members. it is a very great pleasure indeed to introduce to you Mr. Bartells, your First Vice-President. Mr. Bartells is one of those—we might call him a rara avis. This Association, like all others, has a certain number of men who talk

a great deal and say very little, and we have others who talk very little but who say a great deal, and Mr. Bartells is one of these. Whenever Mr. Bartells gets up to talk we know that he will say something that people will listen to, and I know that he will ably fill the position to which you have called him. (Applause.)

MR. BARTELLS: Mr. President and members of the Association, this flattery overcomes me and I hardly know what to say to you; but this I will say, that when it was first made known to me that I was nominated and would probably be elected as First Vice-President, I decided to interfere with the election and to refuse to serve; but, upon reflection, I felt that it was due not to myself, but to the large number of this Association who, unfortunately, are not here to-day. Mr. Whitney, our President, represents the polish, intelligence and education, and his constituency would be, perhaps, within the four hundred (applause); but, as a representative of that large number of our Association—we have now nearly 1500—I felt it due to them that I should accept. I hope that during the year I will not be called upon to preside or do any work, and, therefore, I shall constantly remember in my daily prayers that the health and welfare of our President may be retained in vigor, so that my burdens will be simply ornamental. I thank you for this honor. (Applause.)

THE PRESIDENT: The next officer to be installed is the Second Vice-President, Mr. W. S. Thompson, of Washington, D. C.

MR. EBERT: Mr. President, we have the pleasure of introducing to you the Second Vice-President. He is the ornamental man. (Applause.)

THE PRESIDENT: It gives me very great pleasure to introduce to you Mr. W. S. Thompson, the Secoud Vice-President. Mr. Ebert has said that Mr. Thompson is the ornamental man. He may be ornamental just in this exact position of Second Vice-President, in that he hopes, with Mr. Bartells, that he will never be called upon to fill the position of President. But Mr. Thompson is not only ornamental, but he is exceedingly useful; and there is one characteristic of this Association, and, that is, the members of it generally, when they have a good thing, know it, and they want to hang on to it, and that is the reason he has been elected as Seccnd Vice-President. He has filled many offices in this Association and he has always filled them to the honor and the profit and the benefit of the organization, and the members thought that something ought to be done in order to keep him in harness and that his endeavors should be put forward in the future as they have been ever since he joined the Association. (Applause.)

MR. THOMPSON: Mr. President and gentlemen of the Association, I have been the recipient, as President and as delegate, of many honors at your hands, many more in fact than my merits deserved. But, I have the interest and welfare of pharmacy at heart; have always had it. I believe this Association is engaged in the laudable undertaking of promoting our profession, and I am willing, as far as lies within my power, to contribute my humble efforts in that direction, and I can only promise you that should I ever be called upon to serve you in the capacity in which possibly the uncertainties of the future might place me, that I shall do my best to preside over your deliberations with impartiality and with an equal degree of fairness to all. I thank you. (Applause.)

THE PRESIDENT: The next officer is the Third Vice-President, Mr. Jacob A. Miller, of Harrisburg, Pennsylvania.

MR. EBERT: Mr. President, we have the pleasure of introducing to you Mr. Jacob A. Miller, as Third Vice-President.

THE PRESIDENT: Mr. Miller, it gives me very great pleasure to introduce you as the

Third Vice-President of this Association. Your office will be to a certain extent merely ornamental, but it is a compliment due to you for the work you have done in your state in the interest of pharmacy, and there is no doubt but you will, in the position to which you have been elected, continue your efforts in the same direction. (Applause.)

MR. MILLER: Mr. President, ladies and gentlemen, it has been some years since I attended a meeting of the American Pharmaceutical Association, and I find that the methods of business have changed considerably since then. I supposed that the office of Third Vice-President was more for honor than for actual service. I found this morning that I was somewhat mistaken. I was invited to meet with the Council, and was told that as an officer-elect of this Association, I was a member of the Council. I attended the meeting, and I found that some work was expected of even the Third Vice-President of the Association. (Applause.) In electing me to this office I think this Association has somewhat departed from its usual custom. I supposed this office was given to such members as did some work for the Association, and in recognition for their services. I have not attended the meetings of this Association very frequently and have done very little of its work. However, I accept the office in the spirit in which it has been given. I thank you for electing me, and will endeavor to discharge my duties to the best of my knowledge and ability. (Applause.)

THE PRESIDENT: The next officer is the Treasurer, Mr. S. A. D. Sheppard, of Boston.

MR. EBERT: Mr. President, it gives me great pleasure to present to you Mr. Sheppard as Treasurer of the Association, who holds all the money of the Association.

THE PRESIDENT: Mr. Sheppard, we have to go through the rules laid down in the Constitution and By-Laws. I think it is rather out of place for me to be introducing Mr. Sheppard. We all know Mr. Sheppard, and any member of the Association who does not know him will know his signature anyway—that peculiar vertical writing on a strip of yellow paper reminding us that $5 is due. Now, Mr. Sheppard is another example of the good taste and wise judgment of this Association; it is a good thing, and they know it and they want to keep it. We passed a vote of thanks the other day here to Mr. Sheppard for the honest manner in which he carried on the financial affairs of the Association. I don't know that it was necessary. Mr. Sheppard couldn't be anything else if he tried ever so hard. I do not know there is anything more needed for me to say regarding Mr. Sheppard, for you all know him, and those of you who are new members and do not know him will after while. (Applause.)

MR. SHEPPARD: Mr. President and fellow members, I wish I knew all of you as well as perhaps you know my face and signature. I want to know every member of this Association because I do believe most thoroughly in the benefits that accrue to us all in the mutual relation of friendship. I am a firm believer in that idea as in the forefront of all the good things of the world, and, as you have called upon me again to serve you another year, I can only say as Prof. Beal did yesterday or this morning, I think it was, when he was taking the position of Chairman of the Educational Section, that he realized fully that the position was that of a servant. Your officers are put here to do your bidding, and in that place I cheerfully go forward to do whatever work your interests may demand. I feel that you have been very partial to me, and I appreciate the confidence that you express by this renewed election. And, while I am speaking on this point, I cannot neglect calling attention to one other officer of this Association who will not be installed here to-day, but who deserves it many more times than I do, and that is our worthy secretary of our Committee on Membership, George W. Kennedy. (Prolonged applause.) I speak of this matter, fellow members, because I have sat beside that man year after year, I have been in close touch with him on the financial work of this Association year

after year. I have known his work intimately for twenty-four years, and he occupies the unique position that for the last twenty-six years he has never missed a meeting of this Association, and I want every one of you to appreciate him and love him as I do. (Applause.) I only say this because he has not a chance to come up here and be installed and look you in the face as I am looking at you now. With these few words, I thank you, fellow members, once more. (Applause.)

THE PRESIDENT: The next officer to be installed is the General Secretary, Charles Caspari, Jr.

MR. EBERT: The Secretary needs no introduction.

THE PRESIDENT: No, I do not think it is necessary in the case of Mr. Caspari. He is another example of the good judgment of the Association, and I hope you will appreciate his good work. I can testify to it, and I would like to say now, although probably it is out of place, that I believe this Association has two or three of the very best officers it can possibly have, and all the work, or a great deal of the work, falls upon those three men, and it is due to them that we are in our present prosperous condition. I take pleasure in presenting Mr. Charles Caspari, Jr., of Baltimore, as our General Secretary. (Applause.)

MR. CASPARI: Mr. President and fellow-members of the Association, I do not desire to burden you with a speech. You are all aware of the fact that the Secretary is a very busy man and has no time to make addresses, but I desire to express to you my sincere thanks for this renewed expression of your confidence. When I was elected four years ago at Asheville, I felt scarcely able to cope with the heavy duties which I knew would fall upon the office of Secretary. I have, however, gradually managed to adapt myself to the proper handling thereof, and this re-election at your hands at this time comes as a most pleasant proof of the fact that I have done so, at least in part, to your satisfaction. I will endeavor to do so again in the future, and thank you for your confidence. (Applause.)

THE PRESIDENT: The next officer to be installed is the Reporter on the Progress of Pharmacy, Mr. C. Lewis Diehl.

MR. EBERT: Mr. President, allow me to present to you Mr. C. Lewis Diehl, who has been re-elected to the office of Reporter on the Progress of Pharmacy.

THE PRESIDENT: Mr. Diehl, it gives me very great pleasure to introduce you as the Reporter on the Progress of Pharmacy. Mr. Diehl is one of the oldest, staunchest and most hard-working members that this Association has ever had or probably will ever have. (Applause.)

MR. DIEHL: Mr. President and fellow-members, I thank you for the kind expressions that you have made in my behalf, and I thank you all for having again elected me to the office I have filled for so many years. I take it to be a testimonial of your approval of my past work, and I beg to assure you that I will try to continue the merit of your approval in the future. (Applause.)

THE PRESIDENT: The next officers are the new members of Council elected for three years, William A. Frost, of St. Paul, Caswell A. Mayo, of New York, and George F. Payne, of Atlanta, Ga.

(Messrs. Frost, Payne and Mayo, were here introduced to the President by Mr. Ebert.)

THE PRESIDENT: Sometimes members may be elected to the Council who have not distinguished themselves very much in the organization, but I think in this case the Nominating Committee has been actuated by very wise motives, and they have picked out three men, each of whom has distinguished himself in some particular line. Now, Dr. Payne has made his name famous in connection with the chairmanship of the Committee on the Status of Pharmacists in the Army and Navy Service; Mr. Mayo, on the Transportation Committee and various other ways, and to Mr. Frost we owe this meeting at Lake Minnetonka. It was mainly throngh his endeavors, and it was mainly through his work, that we have had such an exceedingly enjoyable and exceedingly profitable meeting as we have had during the past week.

MR. FROST: Mr. President, and fellow members: When President Morrison started to speak of the line in which the three members elected to the Council had distinguished themselves, and started with Dr. Payne, I knew very well what he was going to say; when he came to Mr. Mayo I again knew about what he was going to say; but when he came to me I wondered in what way I had distinguished myself; I never before knew I had any distinction. I thank the Association very much for the honor that you have bestowed upon me, and I can only promise on my part that I'll do the best I can to fill the office, and I know that the other two members will do their part. (Applause.)

MR. MAYO: Ladies and Gentlemen, since I must say something, I presume that it is incumbent upon me to thank you for the honor done me by election to membership in the Council of this Association. But while appreciating the honor, it is not with unmixed joy that I acknowledge it. In my mind the Council has ever appeared as a body of potent, grave and reverend seignors, hoary with age and bowed down beneath the accumulated wisdom of years. My election to such a body comes upon me with a distinct shock. Am I, too, grown so old, so hoary and so grave as to merit this almost unwelcome honor? I must plead guilty to the existence of one or two stray hairs of white, to a slight tendency to expansion on the part of my manly brow at the expense of my coiffure; but I had scarcely acknowledged these things to myself when alone in the dark, and here I find you bruiting it abroad from the house-tops.

Really, gentlemen, you must pardon me if I fall somewhat short of the proper degree of gratitude, if I even speak with a certain bitterness of my elevation. It is true that the tender bloom of youth is gone ere youth itself be fled, but in the hurry and bustle of life we are scarcely aware of it until some rude shock such as this awakens us to the realization of the fact that we have long lost the bloom and freshness of youth, and are verging into the sere and yellow leaf.

Can you expect me to be grateful to you for awakening me at last to the fact that I have passed from the category of a young man of promise into the fifth age—

> "With eyes severe and beard of formal cut,
> Full of wise saws and modern instances"?

Certainly not.

I know that my election was meant in kindness, and I submit with the best grace I can muster, but I none the less feel the pain of the blow which has made of me an elder among you. (Applause.)

Mr. Payne was here called for, and responded as follows:

Mr. President and fellow members, I little thought about two minutes ago that I would be called upon to say a word, for I had counted myself one among those that would not be installed; and when I came upon the stage and Mr. Frost was called upon, I thought he was to be our spokesman, and then when Mr. Mayo got up I knew my time was coming. (Laughter.) I hadn't prepared anything to say; I knew I had not distinguished

myself, and I felt fully aware that nothing succeeds like success, and, with the matter that I have had in hand for some time past, I am afraid that instead of distingnishing myself, if I don't succeed I will extinguish myself. I am, consequently, now upon trial, and I don't know whether I will carry out your expectations or not; but I will promise, both for the committee and as a member of it, that I will do the best I can. But, I don't claim to be bald-headed yet. (Applause.) When I sometimes go before a farmer legislature in Georgia and they call me up to get my views and to testify before the committees, I try to appear as old then as possible, because they don't think a man has wisdom unless he has a bald head. And when I tell them that I have been engaged in pharmacy for thirty-five years and have been an analytical chemist for twenty-five years, then they look at me as if they thought I lied, but I go on to explain that I have been in both kinds of business at the same time. But if they will give me time I will get bald after a while, and I wish you to deal kindly with me on account of my youthfulness, but I will certainly do the best I can in every place you call upon me to act. (Applause.)

THE PRESIDENT: The Secretary of the Council and the Secretary on Membership is next. He has been referred to as the only officer in the Association who was not to be installed; but I hold that he, being the only man in the organization who holds two positions, should be installed twice. (Applause.)

MR. EBERT: Mr. Prssident, we beg to introduce to you Mr. Geo. W. Kennedy, who has been elected Secretary of the Council.

THE PRESIDENT: Gentlemen, I take pleasure in introducing Mr. Geo. W. Kennedy, of Pottsville, Pa., as Secretary of the Council. Mr. Kennedy has been for over twenty years in the same office in this Association. He has always been a hard-working officer, and as I said before, there are three men to whom the success of this Association is principally due, and Mr. Kennedy is one of them. He has always put forth his best efforts; he has never spared himself in the interests of this Association; he has, in fact, become so accustomed to work for us that in a conversation with him a few evenings ago, I told him, when he suggested the posssbility of ever giving it up, I told him he couldn't do it, that he would certainly get back into the work again because he was so interested in it.

MR. KENNEDY: Mr. President and gentlemen, I hardly expected that I would be brought up here to be installed after serving in the capacity in which I have served in this Association, first as chairman of the Executive Committee, which took in both the work of the Council as it now stands, and also the work of the Committee on Membership. Mr. Sheppard has intimated to you that I had never been installed, and he has spoken my speech. I hardly know what to say on the subject. I am always glad to work in the interests of the Association, and have done so ever since I became a member in 1869, having attended the next meeting in 1870, and have not missed one meeting since. (Applause.) In 1874, at the meeting in Louisville, I was first elected as Chairman of the Executive Committee, and as I have stated, that committee included the work of the Council and the Membership Committee as it now stands. During that time, it may be of some little interest to you to know, over three thousand—approximately, I can't say accurately—applications have passed through my hands, a very large number when you think of it, and when you know that we have only a little over fifteen hundred members on the roll at this time, which does not include the number added at this meeting. You will wonder where all the members have gone to that have been elected by this Association. I can account, gentlemen, for a few, may be one-sixth of that number. I have written, I suppose, during that time about five hundred obituaries. Just think of it! One can scarcely realize that so many of our members have departed.

Gentlemen, I thank you kindly, and I trust that I shall be able to discharge my duties

both as Secretary of the Council and as the Secretary of the Committee on Membership to the entire satisfaction of all. (Applause.)

MR. WHITNEY: Gentlemen, in assuming for the first time the duties of the office to which I have been called, I think I am justified in making my first request at this time, and on the ground that my duties thus far have been confined to a very small association over which I have been called to preside. This is a large one. I have noticed several times that the process of torrefaction has been carried on on the floor of the meetings. It has always seemed to me that the proper place for that kind of work should be either in the loft or in the basement. I speak of this, for I desire that when it becomes my duty to preside over this body when it meets in Baltimore next year, that I shall not be roasted. (Applause and laughter.) Gentlemen, I await your pleasure.

MR. MAIN: Mr. President, I have a resolution here:

Resolved, That the thanks of this Association be and the same are hereby extended to the President and other retiring officers of the Association for the able and impartial manner in which they have discharged their duties during their terms of office.

Motion was seconded by several, a rising vote called for, and carried unanimously.

MR. MAIN: I move, Mr. President, that the Association do now adjourn, and that it stand adjourned until 10 o'clock, September 6th, at the close of the social session arranged for in accordance with the By-Laws.

Motion seconded and prevailed.

CHAS. CASPARI, JR., *General Secretary*.

ELEVENTH SESSION—MONDAY, SEPTEMBER 6, 1897.

The Association was called to order at 10 o'clock, a. m., by Edw. Shumpik, who presided in the absence of President Whitney. Chas. T. Heller was appointed temporary secretary.

The reading of the minutes of the last session was on motion dispensed with.

The social session having been concluded and no new business presented, it was, on motion of Chas. T. Heller, duly seconded, agreed that the Association do now adjourn to meet again at Baltimore, Md., on Monday, August 29, 1898.

CHAS. T. HELLER, *Secretary Pro. Tem.*

The following letter was received on October 30, 1897, from Mr. A. E. Ebert, of Chicago, Ills., with the statement that the same formed a part of the correspondence presented to the Council at the meeting at Lake Minnetonka, in regard to the reinstatement of a former member; but that, having been mislaid at the time, it could not be printed in the Minutes of Council read at the first General Session and should therefore be now published at the end of the report of the proceedings of the General Sessions, already in print, so as to complete the records of the matter in question.

(See letters of Messrs. Stearns and Sargent on pp. 20 and 21, which this letter should precede.)

CHAS. CASPARI, JR., *Gen'l Sec'y.*

CHICAGO, *August* 7, 1897.

MR. FREDERICK STEARNS, *Detroit, Mich.*

Dear Sir: Learning that you have returned to this country after a long absence, and wishing to give public expression to our wishes, Mr. Ebert and myself have had several conferences upon the best plan for your reinstatement as a member of the American Pharmaceutical Association, which we mutually regard as a proper thing to do, in the event that you personally have no objection to our effort in this direction, and would feel willing to make such a statement of your feelings regarding such a step, as would tend to remove whatever prejudice may yet remain in the mind of any one concerning your former attitude, when the original action was had.

You may remember that the matter was first presented to the meeting at Chicago when but few members were present, and upon the suggestion of the chairman, action was delayed until the following morning, so that the members might be better prepared to act with deliberation upon the matter involved. You were present when action was finally taken, and no reason or intention was mentioned by you to placate the sentiments of those who felt it to be their duty to uphold the ethics of the Association, however unpleasant its action might be.

Time and reflection may have changed your attitude, and have no doubt softened the feelings of those who opposed your course at that time. It is with this hope that some of your friends desire to aid your reinstatement, and wish to have an expression of your views, to show their action is not without reason, nor without consultation with you. I wish to express, for Mr. Ebert and myself, our warm regard for you and the hope that you will co-operate with us, in any proper and dignified manner, to bring about our desire.

Your reply addressed to me will be properly handled by Mr. Ebert and some other friends. Yours very truly, E. H. SARGENT.

ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED BY THE TREASURER FOR ANNUAL DUES OR CERTIFICATES, FROM JULY 1, 1896, TO JULY 1, 1897.

	Annual Dues.	Certificates.
Acker, Philip.........'94-'95-'96	$15 00	
Adamick, Gustave H. ....'96	5 00	
Aimar, Charles P. ....'96	5 00	
Airheart, Israel B...........'96	5 00	
Alexander, Maurice W.......'96	5 00	
Allison, William O...........'97	5 00	
Alpers, William C. ....'96	5 00	
Amend, Bernard G. ......'96-'97	10 00	
Amend, Otto P...........'96-'97	10 00	
Anderson, Samuel ....'96	5 00	
Andrew, Edgar C. .... '96	5 00	
Andrews, Josiah H..........'96	5 00	
Andriessen, Hugo...........'96	5 00	
Ardery, Lorimer.............'96	5 00	
Argenti, Jerome, J. B........'96	5 00	
Arnold, Charles F...........'96	5 00	
Arny, Harry V...........'96-'97	10 00	
Auf'mwasser, Hugo W.......'94	5 00	
Auf'mwasser, Julius H.......'94	5 00	
Ault, Edward A.............'96	5 00	
Avary, Moody B......'94-'95-'96	15 00	
Averill, William H.......... '96	5 00	
Axness, Ole M..............'96	5 00	
Ayer, Charles F.............'95	5 00	
Bailey, Frederick ....'97	5 00	
Baird, Julian W. ....'97	5 00	
Baker, Edwin ....'97	5 00	
Baker, T. Roberts...........'97	5 00	
Ball, Charles E...........'96-'97	10 00	
Ballard, John W. ....'96-'97	10 00	
Balser, Gustavus............'97	5 00	
Baridon, Louis R. ....'97	5 00	
Baril, Joseph B. ....'95	5 00	
Bartells, George C. ....'96	5 00	
Barth, George F..... ......'96	5 00	
Bartlett, N. Gray.....'94-'95-'96	15 00	
Bartley, Elias H............'97	5 00	
Bassett, Charles H......... ..'94	5 00	
Bastin, Edson S. ....'96	5 00	
Baylis, Lewis F.............'97	5 00	
Beal, James H...............'97	5 00	
Beardmore, William A. ......'96	5 00	
Beasley, William A. ....'96	5 00	
Bechberger, Henry ....'96	5 00	
Becker, Charles L. ....'96-'97	10 00	
Behrens, Emil C. L..........'96	5 00	
Behrens, Paul J.............'96	5 00	
Beitenman, William W.......'97	5 00	
Bell, S. Howard..........'96-'97	10 00	
Belt, James F. ....'94-'95-'96-'97	20 00	
Belt, Z. James..............'96	5 00	
Benfield, Charles W..........'96	5 00	
Benhard, Albert H...........'96	5 00	
Benton, Wilber M........'96-'97	10 00	
Behringer, George M.....'96-'97	10 00	
Berryhill, Henry P...........'97	5 00	
Betzler, Jacob..............'96	5 00	
Beyschlag, Charles ....'97	5 00	
Billings, Henry M. ......'96-'97	10 00	
Amount carried forward	$390 00	....
Amount brought forward.....	$390 00	....
Bird, Harry L. ....'94	5 00	
Bishop, Samuel E............'96	5 00	
Black, John R...............'96	5 00	
Blackman, Augustus S........'96	5 00	
Blackman, William M. ......'96	5 00	
Blackmore, Henry S. ....'96	5 00	$7 50
Blair, Henry C........ ..'96-'97	10 00	
Blake, James E..............'96	5 00	
Blanding, William O. ....'97	5 00	
Blank, Alois.................'96	5 00	
Bley, Alphonso A. W.........'97	5 00	
Bloomstein, Max ....'96	5 00	
Bobbitt, James H.........'95-'96	10 00	
Boeddiker, Otto..............'96	5 00	
Boehm, Solomon.............'96	5 00	
Bond, John B................'96	5 00	
Borell, Henry A. ....'97	5 00	
Bowron, Walter H...........'96	5 00	
Boyce, Samuel R. ....'96	5 00	
Boyd, George W.............'96	5 00	
Boyden, Edward C...........'96	5 00	
Brace, William D. ....'95	5 00	
Bradbury, Wymond H. .....'96	5 00	
Bradley, Frank H. ....'96	5 00	
Bradley, Theodore J......'96-'97	10 00	
Brandenberger, Adolph......'96	5 00	
Braun, Adolf...............'96	5 00	
Braunwarth, Alice L.........'97	5 00	
Brecht, Frederick A......'96-'97	10 00	
Brewer, John W.............'96	5 00	
Briggs, Andrew G. ....'96	5 00	
Brooks, George W...........'97	5 00	
Brown, Albert E............'96	5 00	
Brown, Robert A. ....'96	5 00	
Brown, William A. ....'97	5 00	
Brown, William T. ....'96	5 00	
Bruck, Philip H. ....'97	5 00	
Bruguier, Francis............'96	5 00	
Brundage, Albert H..........'97	5 00	
Brunner, Chas. H. ....'96	5 00	
Brunner, Norman I. ....'96	5 00	
Bunker, Elihu...............'96	5 00	
Burg, John D...........'96-'97	10 00	
Burgheim, Jacob ....'96	5 00	
Burkhardt, Mark A...'94-'95-'96	15 00	
Burnham, Alfred A. ....'97	5 00	
Burrill, John W. ....'96	5 00	
Burrough, Horace ....'96-'97	10 00	
Burton, Wm. A...... ....'96	5 00	5 00
Butler, Chas. H. ....'97	5 00	
Butler, Freeman H...........'97	5 00	
Button, Charles E...........'97	5 00	
Byrne, John.................'97	5 00	
Caldwell, James W...........'94	5 00	
Calvert, John...............'96	5 00	
Carrell, Eugene A...........'96	5 00	
Carslake, George M.........'96	5 00	
Carter, Frank H. ....'96-'97	10 00	
Amount carried forward	$725 00	$12 50

	Annual Dues.	Certificates.
Amount brought forward.....	$725 00	$12 50
Carton, John A..............'96	5 00	
Case, Charles H.............'96	5 00	
Caspari, Charles, Jr..........'97	5 00	
Casper, Thomas J...........'97	5 00	
Chabot, David P.........'96-'97	10 00	
Chandler, Charles F..........'97	5 00	
Chapin, Fred H.............'96	5 00	
Chapin, William A...........'97	5 00	
Chapman, Isaac C...........'96	5 00	
Chapman, William H........'96	5 00	
Charroppin, Emile L......'96-'97	10 00	
Cheatham, Thomas A........'96	5 00	
Childs, William R...........'96	5 00	5 00
Christiani, Charles...........'96	5 00	
Christianson, Lars.......'96-'97	10 00	
Church, Merton E...........'96	5 00	
Claflin, Walter A............'96	5 00	
Clark, John A...............'96	5 00	
Clarke, Louis G..........'95-'96	10 00	
Clowes, William L........'96-'97	10 00	
Coblentz, Virgil..............'96	5 00	
Cogan, Denis S..............'96	5 00	
Cole, Allen M...............'96	5 00	
Cole, Howson W.............'96	5 00	
Cole, Victor L.........'96-'97-'98	15 00	
Colen, James A.............'96	5 00	
Collins, Albert B............'97	5 00	
Colton, James B.............'94	5 00	
Conrath, Adam..............'97	5 00	
Cook, Gilbert S..............'97	5 00	
Cook, Thomas P............'97	5 00	
Coon, James V. D...........'96	5 00	
Copeland, Sidney F......'96-'97	10 00	
Corcoran, Charles E.........'96	5 00	
Cornell, Edward A...........'96	5 00	
Cotton, Robert M...........'94	5 00	
Cotton, William H...........'96	5 00	
Coupe, Robert E.........'96-'97	10 00	
Cowdin, George H...........'95	5 00	
Cramer, Max...............'97	5 00	
Crampton, Ferd L........'96-'97	10 00	
Crane, Frank T..............'96	5 00	
Criswell, Francis M..........'96	5 00	
Cronheim, Solomon..........'96	5 00	
Crowdle, John E.............'96	5 00	
Crum, John D........'94-'95-'96	15 00	
Culbreth, David M. R........'97	5 00	
Culver, Anson A.............'96	5 00	
Curry, David W.............'96	5 00	
Cutts, Foxwell C., Jr........'97	5 00	
Dadd, Robert M.........'96-'97	10 00	
Danek, John F..............'96	5 00	
Danner, Wm. E.........'96-'97	10 00	
Dare, Charles F.............'96	5 00	
D'Avignon, J. Eugene.......'96	5 00	
Davis, Edward B............'96	5 00	
Davis, Eugene M............'96	5 00	
Davis, John A..............'96	5 00	
Davis, Samuel C............'94	5 00	
Davis, William M.......'96-'97	10 00	
Davison, James.............'97	5 00	
Dawson, Edward S., Jr...'95-'96	10 00	
Dawson, John H............'96	5 00	
Day, George A.............'96	5 00	
Day, William B.............'96	5 00	
DeArmona, Joseph R.'94-'95-'96	15 00	
DeForest, William P.........'95	5 00	
DeGraffe, Bertha L..........'96	5 00	
Dedrick, Wm. Fred..........'94	5 00	
Dejan, J. B. George.........'96	5 00	
Demond, Otto J.............'96	5 00	
Dennin, Charles.............'96	5 00	
Dennin, Edwin C............'96	5 00	
Devine, John...........'96-'97	10 00	
Dewender, Wm. H.......'96-'97	10 00	
Amount carried forward......	$1200 00	$17 50

	Annual Dues.	Certificates.
Amount brought forward.....	$1200 00	$17 50
Dewoody, William L........'96	5 00	
Diebert, Thomas T..........'96	5 00	
Diehl, C. Lewis.............'96	5 00	
Dill, J. Byron...........'94-'95	10 00	
Dilly, Oscar C..............'96	5 00	
Dimmitt, Addison...........'96	5 00	
Dimock, Robert H...........'97	5 00	
Dixon, John M...........'96-'97	10 00	
Dixson, Frederick H.........'96	5 00	
Dobbins, Edward T..........'97	5 00	
Dodd, Simon W......'94-'95-'96	15 00	
Dohme, Alfred R. L......'96-'97	10 00	
Dohme, Charles E........'96-'97	10 00	
Dohme, Louis..............'96	5 00	
Dorner, Emil A..............'96	5 00	
Dorr, George W..........'96-'97	10 00	5 00
Dougherty, Samuel E.....'96-'97	10 00	
Douglass, Henry............'96	5 00	
Dowdy, Joseph F. Jr.....'95-'96	10 00	
Downing, Benjamin F. Jr.....'96	5 00	
Downing, Lucien B..........'97	5 00	
Drake, Frederick T.......'96-'97	10 00	
Dreher, Louis...............'94	5 00	
Drew, Walter I.............'96	5 00	5 00
Driggs, Charles M...........'94	5 00	
Druehl, Frank A............'96	5 00	
Duble, Jesse B...............'96	5 00	
DuBois, William L..........'96	5 00	
Duckett, Walter G.........'96	5 00	
Duggan, James..............'97	5 00	
Dunn, John A...............'97	5 00	
Durkee, William C..........'96	5 00	
Dutcher, Alfred L...........'96	5 00	
Eads, Robert I...........'96-'97	10 00	
Eagny, James T.............'97	5 00	
Earl, Noble C...............'96	5 00	
Easterday, Herbert C........'96	5 00	
Eberbach, Ottmar...........'96	5 00	
Eberle, Eugene G............'96	5 00	
Eccles, Robert G............'97	5 00	
Eckel, Augustus W......'94-'95	10 00	
Eckford, Jos. Wm.'94-'95-'96-'97	20 00	
Eckstein, Andrew J..........'97	5 00	
Eddy, Henry C...........'95-'96	10 00	
Edwards, Frederick B........'96	5 00	
Eggers, Frederick H.........'96	5 00	
Ehrlicher, Henry M......'95-'96	10 00	
Eichberg, Julius H.......'94-'95	10 00	
Eichrodt, Charles W......'96-'97	10 00	
Ekman, N. Adolf............'96	5 00	
Eliel, Leo...................'96	5 00	
Emanuel, Louis..........'96-'97	10 00	
Emerson, Hermann L........'96	5 00	
Emich, Columbus V..........'97	5 00	
England, Joseph W.......'95-'96	10 00	
Eppley, James K............'96	5 00	
Ernst, Frank F..............'96	5 00	
Eschmann, F. W. R..'95-'96-'97	15 00	
Estabrook, Henry A.........'96	5 00	
Estes, Joseph J..............'97	5 00	
Evans, Joseph S............'97	5 00	
Eyssell, George.............'96	5 00	
Fairchild, Benjamin T........'96	5 00	
Fairchild, Samuel W.....'96-'97	10 00	
Feil, Joseph.............'95-'96	10 00	
Fenner, Alexander W., Jr....'96	5 00	
Fieber, Gustavus A..........'96	5 00	
Field, Claud.............'96-'97	10 00	
Fink, Frederick Wm.........'97	5 00	
Finlay, Alexander K.....'96-'97	10 00	
Fischer, E. Baldwin..........'96	5 00	
Fish, Frederic W............'94	5 00	
Fisher, Elbert E.............'97	5 00	
Flanagan, Lewis C...........'97	5 00	
Flemer, Lewis..............'96	5 00	
Amount carried forward......	$1710 00	$27 50

	Annual Dues.	Certificates.
Amount brought forward	$1710 00	$27 50
Fletcher, John W. '97	5 00	
Flint, George B. '96	5 00	
Flood, William H. '94	5 00	
Fowler, Joseph W. '96	5 00	
Fox, Peter P. '96-'97	10 00	
Frames, J Fuller '96	5 00	
Fraser, Horatio N. '97	5 00	
Frauer, Herman E. '96-'97	10 00	
French, Harry B. '97	5 00	
French, John I. '96-'97	10 00	
Frost, William A. '96	5 00	
Frye, George C. '97	5 00	
Gallagher, John C. '96	5 00	
Gammon, Irving P. '96	5 00	
Gane, Eustace H '96	5 00	
Gardner, Robert W. '96-'97	10 00	
Gates, Howard E. '96	5 00	
Gausewitz, William '96	5 00	5 00
Gayle, John W. '97	5 00	
Gayner, John N. '96	5 00	
Geiger, Charles F. '96	5 00	
Geisler, Joseph F. '96	5 00	
Gerhard, Samuel '95-'96	10 00	
Gessner, Emil A. '97	5 00	
Getty, Wilmot S. '96	5 00	
Gill, George. '97	5 00	
Gilpin, Henry B. '96-'97	10 00	
Girling, Robert N. '96	5 00	
Godbold, Fabius C. '96-'97	10 00	
Godding, John G. '96-'97	10 00	
Good, James M. '96	5 00	
Goodale, Harvey G. '96-'97	10 00	
Goodwin, Lester H. '96	5 00	
Goold, Joseph E. '96-'97	10 00	
Gorgas, George A. '96-'97	10 00	
Gosman, Adam J '97	5 00	
Grace, Wm. D. '96-'97	10 00	
Grandjean, Eugene. '96	5 00	
Grassly, Charles W. '96	5 00	
Gray, Henry R. '96	5 00	
Gray, William '96-'97	10 00	
Green, Benjamin. '97	5 00	
Green, Hamer H. '95-'96	10 00	
Greene, William R. '97	5 00	
Greve, Charles M. '96	5 00	
Greve, Theodore L. A. '96-'97	10 00	
Greyer, Julius '96	5 00	
Griffen, Truman '96	5 00	
Gross, Edward Z. '96	5 00	
Grossklaus, John F. '96	5 00	
Haake, William H. '96	5 00	
Habliston, Charles C. '96	5 00	
Hall, Edwin B. '97	5 00	
Hall, Horace B. '96	5 00	
Hall, William A. '96	5 00	
Hallberg, Carl S. N. '96	5 00	
Hancock, Franklin W. '94	5 00	
Hancock, J. Henry. '96	5 00	
Harbaugh, Wilson L. '96-'97	10 00	
Hardin, John H. '94-'95-'96	15 00	
Hardy, Cyrus D. '96	5 00	
Harrah, John W. '96	5 00	
Harris, Francis M. '96	5 00	
Harrison, Jacob H. '96	5 00	
Harrison, William J. '96-'97	10 00	
Harter, Isaac F. '97	5 00	
Hartnett, Eugene '95-'96	10 00	
Hartshorn, Frederick A. '96-'97	10 00	
Hartwig, Charles F '96-'97	10 00	
Hartwig, Otto J. '96	5 00	
Hassebrock, Henry F. '96	5 00	
Hassinger, Samuel E. R. '97	5 00	
Hattenhauer, Robert C. '97	5 00	
Hatton, Edgar M. '97	5 00	
Hatton, Ellmore W. '97	5 00	
Amount carried forward	$2195 00	$32 50

	Annual Dues.	Certificates.
Amount brought forward	$2195 00	$32 50
Hauenstein, William. '96	5 00	
Haussman, Fred. W. '97	5 00	
Hawkins, M. Smith. '97	5 00	
Hawley, William B. '97	5 00	
Hay, Edward A. '97	5 00	
Hayes, Horace P. '97	5 00	
Hayes, James H. '97	5 00	
Haynes, David O. '97	5 00	
Hays, Joseph A. '96	5 00	
Hechler, George L. '96	5 00	
Heddens, Claus H. '96	5 00	
Hedley, Thomas A. '94-'95	10 00	
Heebner, Charles F. '96	5 00	
Heinemann, Otto '96	5 00	
Heinitsh, Sigmund W. '97	5 00	
Helfman, Joseph. '95-'96	10 00	
Helke, William L. '97	5 00	
Heller, Charles T. '96	5 00	
Hemm, Francis. '96	5 00	
Hemm, Louis P. '96	5 00	
Henderson, Archibald K. '96-'97	10 00	
Henry, Charles '96-'97	10 00	
Henry, Charles L. '96-'97	10 00	
Henry, Frank C. '96	5 00	
Hepburn, John. '96	5 00	
Herbst, William P. '96	5 00	
Heschong, John F. '96-'97	10 00	
Heseltine, Daniel W. '96	5 00	
Hess, Paul L. '96	5 00	
Heydenreich, Emile '96-'97	10 00	
Heyerdahl, Carl Otto '96	5 00	
Hickerson, William H. '97	5 00	
Higby, William H. '96-'97	10 00	
Higgins, Albert W. '96	5 00	
Hill, Frederick J. '96	5 00	
Hillebert, George A. '96	5 00	
Hilton, Samuel L. '96	5 00	
Hinrichs, Gustavus D. '96	5 00	
Hiriat, Sebastian '96	5 00	
Hitchcock, John E. '96	5 00	
Hobbs, William. '95-'96	10 00	
Hoch, Aquila. '96-'97	10 00	
Hoffman, Julius '96	5 00	
Hoffmann, Frederick. '96-'97	10 00	
Hogan, John J. '97	5 00	
Holgate, Francis H. '96	5 00	
Holmes, Clay W. '97	5 00	
Holmes, Henry E. '94-'95-'96	15 00	
Holverson, Henry T. '96	5 00	
Hood, Charles I. '97	5 00	
Hopp, Lewis C. '96	5 00	
Horn, Wilbur F. '96	5 00	
Hover, William A. '96	5 00	
Howard, Fletcher. '97	5 00	
Howey, John J. '96	5 00	
Howson, Arthur B. '96	5 00	
Hoyt, George M. '96-'97	10 00	
Hudson, Arthur '96	5 00	
Huested, Alfred B. '97	5 00	
Huhn, George '94-'95	10 00	
Huntington, William H. '97	5 00	
Hurd, John C. '96-'97	10 00	
Hurlebaus, George W. '96	5 00	
Hurty, John N. '97	5 00	
Huston, Charles. '97	5 00	
Hutton, Harry D. '96	5 00	
Hydren, Carl. '96	5 00	
Hynson, Henry P. '96	5 00	
Ingalls, John. '96	5 00	
Irvin, William A. '96	5 00	
Jacobs, Joseph '97	5 00	
James, William T. '96	5 00	
Joergensen, Sophus. '96	5 00	
Joerger, Frederick '96	5 00	
Johnson, Charles B. '96	5 00	
Amount carried forward	$2650 00	$32 50

	Annual Dues.	Certificates.
Amount brought forward......	$2650 00	$32 50
Johnson, Daniel D.......'96-'97	10 00	
Johnston, Henry A..........'96	5 00	
Jones, Alexander H..........'97	5 00	
Jones, David F..............'96	5 00	
Jones, Simon N..............'96	5 00	
Joy, Edwin W..........'95-'96	10 00	
Joyce, Robert...............'96	5 00	
Jungkind, John A...........'96	5 00	
Jungmann, Julius........'95-'96	10 00	
Kalish, Julius ....'97	5 00	
Karb, George J..... ....'97	5 00	
Kauffman, George B.........'97	5 00	
Kebler, Lyman F............'97	5 00	
Keefer, Charles D...........'96	5 00	
Keenan, Thomas J ....'96	5 00	
Keeney, Caleb R............'97	5 00	
Kellam, Chas. R. J..........'96	5 00	
Kelly, Edward S.............'96	5 00	
Kelly, George A.........'96-'97	10 00	
Kemp, Edward ....'97	5 00	
Kennedy, Ezra J.............'96	5 00	
Kennedy, George W.........'96	5 00	
Kenney, Herbert E......'95-'96	10 00	
Kent, Henry A., Jr...........'96	5 00	
Keppler, Charles I........'95-'96	10 00	
Keppler, Christian L.....'95-'96	10 00	
Kerr. Frank G...........'95-'96	10 00	
Kettler, Edward, Jr.......'96-'97	10 00	
Kiedaisch, John F., Jr.......'97	5 00	
Kilmer, Frederick B.........'96	5 00	
King, George A. N.......'96-'97	10 00	
King, Robert B..............'96	5 00	
Kirchgasser, William C.......'97	5 00	
Kirk, James E...............'96	5 00	
Kirkland, Derwentwater......'97	5 00	
Klein, Ernest F..............'96	5 00	
Klie, G. H. Charles..........'96	5 00	
Kline, Mahlon N.............'97	5 00	
Knabe, Gustavus A..........'96	5 00	
Knoebel, Thomas............'96	5 00	
Knoefel, Bruno ....'96-'97	10 00	
Knoefel, Charles D..........'96	5 00	
Koch, John A. ....'96	5 00	
Koch, Julius A..............'96	5 00	
Koch, Louis.................'97	5 00	
Koehnken, Herman H. ......'96	5 00	
Kraemer, Henry.............'96	5 00	
Krehe, J. Theodor...........'96	5 00	
Kremers, Edward........'96-'97	10 00	
Krewson, William E..........'96	5 00	
Krieger, Philip ....'97	5 00	
Kuder, William F.....'95-'96-'97	15 00	
Kuhn, Norman A.....'95-'96-'97	15 00	
Kurfurst, Henry F...........'96	5 00	
La Pierre, Elie H............'97	5 00	
Lahme, Charles A....'94-'95-'96	15 00	
Laing, Alfred A..........'96-'97	10 00	
Laird, John.................'97	5 00	
Lampa, Robert R............'96	5 00	
Lander, John C..........'95-'96	10 00	
Lane, Edward B.............'96	5 00	
Lariviere, Telesphore........'96	5 00	
Lauricella, Felice...........'96	5 00	7 50
LaWall, Charles H..........'96	5 00	
Lawton, Charles H...........'96	5 00	
Lawton, Horace A...........'96	5 00	
Layton, Thomas.............'96	5 00	
Lecours, Joseph E. W........'96	5 00	
Lee, Charles J............'96-'97	10 00	
Legendre, Joseph A..........'96	5 00	
Lehman, Louis..............'96	5 00	
Lehn, Louis ....'96-'97	10 00	
Lehr, Philip ....'96-'97	10 00	
Leine, Arthur M.............'96	5 00	
Leist, Jacob L...............'96	5 00	
Amount carried forward	$3140 00	$40 00

	Annual Dues.	Certificates.
Amount brought forward	$3140 00	$40 00
Leonardi, Sydney B...'94-'95-'96	15 00	
Leonhard, Rudolph E.........'96	5 00	
Lernhart, August.........'96-'97	10 00	
Levinson, Joseph............'96	5 00	
Levy, Adolph .... '96	5 00	
Levy, William M............'96	5 00	
Lewi, Theodore J............'96	5 00	
Libby, Henry F..........'96-'97	10 00	
Lilly, Eli......... .....'96-'97	10 00	
Lillv, Josiah K...........'96-'97	10 00	
Linton, Charles E............'96	5 00	
Livingston, Barent V. B..'96-'97	10 00	
Lloyd, John U...............'96	5 00	
Lockie, James A.............'96	5 00	
Loehr, Theodcre C....'94-'95-'96	15 00	
Lohmann, Herman J.........'96	5 00	
Loomis, John C..............'96	5 00	
Lord, Frank J...............'96	5 00	
Lord, Thomas ....'97	5 00	
Lovis, Henry C..............'95	5 00	
Lowd, John C...............'97	5 00	
Lowe, Clement B............'97	5 00	
Lowell, Edward M.......'96-'97	10 00	
Lueder, Fritz................'96	5 00	
Lundberg, John C............'96	5 00	
Lyons, Fred W. ....'96	5 00	
Lyons, Isaac L...........'96-'97	10 00	
Macmillan, Alexander M.....'96	5 00	
MacRae, John Y............'96	5 00	
Macy, Sherman R ...'94-'95-'96	15 00	
Maguire, Andrew.... .....'96	5 00	
Main, Thomas F.........'96-'67	10 00	
Maine, August..............'97	5 00	
Majer, Oscar ....'96	5 00	
Major, John R...............'96	5 00	
Mallinckrodt, Edward ....'96	5 00	
Mann, Albert ....'96	5 00	
Marelius, Charles R.........'96	5 00	
Marshall, Rush P............'96	5 00	
Martin, John C..............'96	5 00	
Martin, Nicholas.H..........'96	5 00	
Mason, Harry B.........'96-'97	10 00	
Mason, Harry R.............'97	5 00	
Massey, William M..........'97	5 00	
Matthews, Charles E.........'97	5 00	
May, Eugene................'97	5 00	
Mayo, Caswell A.........'95-'96	10 00	
McClearn, Henry T.........'96	5 00	5 00
McCrea, Harry F............'96	5 00	
McDonald, George..........'96	5 00	
McElhenie, Thomas D.......'96	5 00	
McFarland, Robert M.......'96	5 00	
McGeorge, William..........'96	5 00	
McGill, John T..............'96	5 00	
McIntyre, Byron F.......'95-'96	10 00	
McIntyre, Ewen.........'96-'97	10 00	
McKesson, G. Clinton.......'97	5 00	
McKesson, John, Jr......'96-'97	10 00	
Mehl, Henry W.............'96	5 00	
Meissner, F. W. Jr...........'97	5 00	
Mennen, Gerhard............'96	5 00	
Merrell, Charles G........'96-'97	10 00	
Merrell, George..........'96-'97	10 00	
Meyer, Alfred...............'96	5 00	7 50
Meyer, William V........'95-'96	10 00	
Michaelis, Gustavus..... ...'96	5 00	
Miles, Henry................'96	5 00	
Miller, Emerson R...........'96	5 00	
Miller, Jacob A.............'96	5 00	
Miller, Jason A.............'97	5 00	
Miller, Turner A.........'96-'97	10 00	
Milligan, Decatur ....'97	5 00	
Miner, Maurice A........'96-'97	10 00	
Miner, Mrs. Mary O.........'97	5 00	
Miner, Orrin E.......... ...'96	5 00	
Amount carried forward	$3635 00	$52 50

	Annual Dues.	Certificates.
Amount brought forward......	$3635 00	$52 50
Mittelbach, William..........'97	5 00	
Mix, Willis L...........'96–'97	10 00	
Moore, George ....'96	5 00	
Moore, Joachim B. ....'96	5 00	
Moore, John T..............'97	5 00	
Moore, Josh. F.............'94	5 00	
Moore, Silas H.............'96	5 00	
Morgan, Aylmer L...........'97	5 00	
Morison, J. Louis D......'96–'97	10 00	
Morrison, Joseph E..... '95–'96	10 00	
Morse, Edward W...........'96	5 00	
Morton, John W............'96	5 00	
Mosher, Wi liam W.........'96	5 00	
Moulton, Daniel P.......'96–'97	10 00	
Mowry, Albert D...........'96	5 00	
Mueller, Adolph............'97	5 00	
Mueller, Ambrose...........'96	5 00	
Mueller, Otto E.............'96	5 00	
Muir, Ebenezer.............'96	5 00	
Mulcahy, Daniel D..........'96	5 00	
Mulford, Henry K........'96–'97	10 00	
Murphy, John S............'96	5 00	
Murray, Benj. L............'96	5 00	
Murray, Emmett L....... ..'96	5 00	
Muth, George L.........'96–'97	10 00	
Myers, Daniel..............'97	5 00	
Nattans, Arthur. ....'96	5 00	
Newman, George A ....'96	5 00	
Newton, Philo W............'96	5 00	
Nichols, John C..........'96–'97	10 00	
Nichols, Thomas B..........'95	5 00	
Nipgen, John A..............'97	5 00	
Nordmann, Herman......'96–'97	10 00	
Norton, George E........'96–'97	10 00	
Nowers, Lawrence E.... ....'96	5 00	
O'Hare, James..............'97	5 00	
O'Neil, Henry M............'96	5 00	
Oberdeener, Samuel..........'96	5 00	
Offutt, Willard C............'96	5 00	5 00
Ogier, John M..............'97	5 00	
Ohliger, Lewis P............'96	5 00	
Oleson, Olaf M.............'96	5 00	
Oliver, William M...........'97	5 00	
Orton, Ingomar F...........'97	5 00	
Osgood, Hugh H............'97	5 00	
Osmun, Charles A...........'96	5 00	
Otis, Clark Z...............'94	5 00	
Ottinger, James J............'97	5 00	
Otto, John N. W...... .....'96	5 00	
Page, David S...............'96	5 00	
Parisen, Allen C......... '96–'97	10 00	
Parisen, George W...........'96	5 00	
Parker, Walter W........'96–'97	10 00	
Parks, John K ....'96	5 00	
Parsons, John...........'96–'97	10 00	
Partridge, Charles K.........'96	5 00	
Partridge, Frank R..........'96	5 00	
Patch, Edgar L..............'97	5 00	
Patterson, Theodore H.......'96	5 00	
Pattison, Charles H...... '94–'95	10 00	
Pattison, George H..........'96	5 00	
Patton, John F.............'97	5 00	
Pauley, Frank C............'96	5 00	
Payne, George F............'97	5 00	
Peacock, Josiah C...........'96	5 00	
Pearce, Howard A...........'97	5 00	
Pease, Autumn V............'97	5 00	
Pease, Francis M. ....'96–'97	10 00	
Perkins, Benjamin A.........'97	5 00	
Perkins, C. William..........'96	5 00	
Perkins, William A..........'96	5 00	
Perry, Frederick W. R.......'95	5 00	
Peter, Minor C..............'96	5 00	
Peters, John M.............'96	5 00	
Petsche, Bismarck W.....'95–'96	10 00	
Amount carried forward	$4085 00	$57 50

	Annual Dues.	Certificates.
Amount brought forward......	$4085 00	$57 50
Peyton, Robert D............'96	5 00	
Pfafflin, Henry A.........'96–'97	10 00	
Pfunder, William ....'96	5 00	
Phillips, Carrie E.........'95–'96	10 00	
Phillips, Charles W..........'96	5 00	
Phillips, Edwin F............'96	5 00	
Pickett, John H.............'96	5 00	
Pieck, Edward L............'96	5 00	
Pile, Gustavus..............'97	5 00	
Pinniger, William............'96	5 00	5 00
Pitt, John R.................'97	5 00	
Plaut, Albert........ ....'97	5 00	
Plenge, Henry...............'96	5 00	
Plummer, Edward ....'96	5 00	
Porter, Henry C......... '96–'97	10 00	
Porter, Louis F..............'96	5 00	
Porter, Millett N............'96	5 00	
Potter, Wm R. ....'97	5 00	
Potts, David G..............'97	5 00	
Powell, Wm. C...............'97	5 00	
Power, Frederick B...... '96–'97	10 00	
Preissler, H. W.............'96	5 00	
Prescott, Albert B........'96–'97	10 00	
Prescott, Horace A.......... '96	5 00	
Preston, Andrew P...........'96	5 00	
Price, Charles H......'95–'96–'97	15 00	
Price, Joseph.........'95–'96–'97	15 00	
Prieson, Adolph..........'96–'97	10 00	
Priest, Carlton R.... .... '96	5 00	
Procter, Wallace.............'97	5 00	
Puckner, William A..........'96	5 00	
Punch, William F............'95	5 00	
Purcell, Nicholas S...'94–'5–'6–'7	20 00	
Quackinbush, Benjamin F....'97	5 00	
Quandt, Arthur A........'96–'97	10 00	
Quandt, Ernest E.........'96–'97	10 00	
Rademaker, Herman H......'96	5 00	
Rand, Daniel M....... ......'96	5 00	
Randall, Frank O............'96	5 00	
Rapelye, Charles A..........'96	5 00	
Rauschkolb, John ....'97	5 00	
Ray, Frederick E.........'95–'96	10 00	
Ray, Peter W..................	....	5 00
Read, Albert M..............'96	5 00	
Redsecker, Jacob H..........'96	5 00	
Reed, Thomas D.............'96	5 00	
Reed, Willoughby H.....'96–'97	10 00	
Reidy, Michael..............'96	5 00	
Renz, Frederick J............'96	5 00	
Reynolds, Howard P.....'96–'97	10 00	
Reynolds, John J............'96	5 00	
Reynolds, William K.........'96	5 00	
Rhode, Rudolph E. ......'96–'97	10 00	
Rice, Charles...... ....'97	5 00	
Richard, Alexander..........'96	5 00	
Richardson, Frank...........'96	5 00	
Richardson, Horatio S.......'97	5 00	
Richardson, Thomas L.......'96	5 00	
Riddell, Benjamin F. ....'97	5 00	
Ridgway, Lemuel A. ....'97	5 00	
Robertson, Peter ....'96	5 00	
Robins, Wilbur F ....'96	5 00	
Robinson, Edward A.........'97	5 00	
Robinson, Ernest F..........'96	5 00	
Rockefeller, Lucius ......'96–'97	10 00	
Rogers, Arthur H............'96	5 00	
Rogers, Henry H............'96	5 00	
Rogers, William H...........'96	5 00	
Rohde, Claus F..............'96	5 00	
Rosenthal, David A..........'96	5 00	
Rowlinski, Robert A........ '97	5 00	
Roy, J. Emile...............'96	5 00	
Ruddiman, Edsel A. ....'96	5 00	
Ruenzel, Henry G...........'97	5 00	
Ruppert, John ....'96	5 00	
Amount carried forward	$4555 00	$67 50

	Annual Dues.	Certificates.
Amount brought forward	$4555 00	$67 50
Rusby, Henry H............'96	5 00	
Ryan, Frank G..........'96-'97	10 00	
Sadtler, Samuel P............'96	5 00	
Sanderson, Stephen F.'94-'95-'96	15 00	
Sargent, Ezekiel H ......'95-'96	10 00	
Sauerhering, Rudolph A. ....'97	5 00	
Saunders, William...........'96	5 00	
Sautter, Louis........ ...'94-'95	10 00	
Sawyer, Charles H.......'96-'97	10 00	
Sawyer, William F...........'96	5 00	
Sayre, Edward A ....'96	5 00	
Sayre, Lucius E.............'97	5 00	
Sayre, William H............'96	5 00	
Schafhirt, Adolph J..........'96	5 00	
Scheffer, Emil ....'96	5 00	
Scheffer, Henry W...........'96	5 00	
Scherer, Andrew.............'96	5 00	
Scherft, John P..............'97	5 00	
Scherling, Gustav ....'96	5 00	
Schieffelin, William J.........'97	5 00	
Schiemann, Edward B........'96	5 00	
Schlaepfer, Henry J..........'97	5 00	
Schley, Steiner... ....'96	5 00	
Schlotterbeck, Augustus G...'96	5 00	
Schlotterbeck, Julius O...'95-'96	10 00	
Schmid, Henry..............'96	5 00	
Schmidt, Carl............'94-'95	10 00	
Schmidt, Ferdinand T....'96-'97	10 00	
Schmidt, Florian C.......'96-'97	10 00	
Schmidt, Frederick M........'97	5 00	
Schmidt, Valentine ....'96	5 00	
Schmitt, George J. F.........'97	5 00	
Schmitt, Joseph M.......'96-'97	10 00	
Schmitter, Jonathan ....'96	5 00	
Schoenhut, Christie H........'97	5 00	
Schoettlin, Albert J........ .'96	5 00	
Scholtz, Edmund L..........'96	5 00	
Schrank, C. Henry...........'97	5 00	
Schroeder, John H...........'96	5 00	
Schueller, Ernst ....'97	5 00	
Schueller, Frederick W.......'97	5 00	
Schuh, Paul G...............'97	5 00	
Schulze, Louis...........'96-'97	10 00	
Schurk, Louis...............'96	5 00	
Scott, William H............'97	5 00	
Scoville, Wilbur L............'97	5 00	
Searby, William M...........'96	5 00	
Selzer, Eugene R.........'96-'97	10 00	
Sennewald, Ferdinand W.....'96	5 00	
Serodino, Herman.........'96-'97	10 00	
Shafer, Erwin C ....'97	5 00	
Shake, Homer C.............'96	5 00	
Shannon, Thomas R..........'96	5 00	
Sharples, Stephen P......'96-'97	10 00	
Shaw, Robert J..............'96	5 00	
Sherman, Charles R......'96-'97	10 00	
Sherrard, Charles C..........'96	5 00	
Sherwin, Eugene A..........'97	5 00	
Sherwood, Henry J.......'96-'97	10 00	
Sherwood, Lewis W..........'97	5 00	
Shoemaker, Richard M.......'97	5 00	
Shreve, John A..........'96-'97	10 00	
Shumpik, Edward........'95-'96	10 00	
Shurtleff, Israel H...... ......'96	5 00	
Siegenthaler, Harvey N......'96	5 00	
Sieker, Ferdinand A......'96-'97	10 00	
Simon, William..............'97	5 00	
Simonson, William.......'95-'96	10 00	
Simpson, William ....'96	5 00	
Simpson. William C.... .....'96	5 00	
Skelly, James J..........'96-'97	10 00	
Slack, Henry R., Jr......'96-'97	10 00	
Sloan, George W............'96	5 00	
Smink, Robert W............'96	5 00	
Smith, B. Frank..........'95-'96	10 00	
Amount carried forward	$5050 00	$67 50

	Annual Dues.	Certificates.
Amount brought forward	$5050 00	$67 50
Smith, Charles B............'96	5 00	
Smith, Clarence P...........'96	5 00	
Smith, Edward S.............'96	5 00	
Smith, Lauriston S...........'97	5 00	
Smith, Linton...............'97	5 00	
Smith, Linville H.........'96-'97	10 00	
Smith, Samuel W............'96	5 00	
Smith, Theodoric.........'96-'97	10 00	
Smith, Thomas E........'95-'96	10 00	
Smith, Willard A.............'97	5 00	
Smithson, David E ....'96	5 00	
Snow, Charles W............'97	5 00	
Snyder, Robert J............'96	5 00	
Sohrbeck, G. Henry.........'96	5 00	
Solomons, Isaiah A.......'96-'97	10 00	
Sombart, John E.........'96-'97	10 00	
Sords, Thomas V............'96	5 00	
Spalding, Warren A..........'97	5 00	
Sparks, James M.........'95-'96	10 00	
Sperry, Herman J. ....'97	5 00	
Sprague, Wesson G..........'97	5 00	
Squibb, Edward H...........'97	5 00	
Stacey, Benjamin F..........'96	5 00	
Staebler, Richard............'96	5 00	
Stahler, William.............'96	5 00	
Stahlhuth, Ernst H. W...'96-'97	10 00	
Stam, Colin F...............'94	5 00	
Stamford, William H.........'96	5 00	
Stamm, Dante M............'96	5 00	
Stark, Harry H....... ......'94	5 00	
Starz, Emil A............'96-'97	10 00	
Staudt, Louis C..............'96	5 00	
Stearns, Henry A............'96	5 00	
Stedem, Frederick W. E.....'97	5 00	
Steele, George R.........'96-'97	10 00	
Steele, James G ....'95	5 00	
Steinhauer, Frederick........'96	5 00	
Stevens, Alonzo B........'96-'97	10 00	
Stewart, Andrew M..........'96	5 00	
Stewart, Francis E.... ..'96-'97	10 00	
Stiles, Justin E..............'96	5 00	
Stoughton, Dwight G........'96	5 00	
Stowell, Daniel..............'96	5 00	
Stuver, Emanuel.........'96-'97	10 00	
Sweet, Caldwell.............'97	5 00	
Tailby, Joseph A............'94	5 00	
Taylor, Walter T.....'94-'95-'96	15 00	
Thames, Joseph J...........'96	5 00	
Thieman, John H., Jr........'96	5 00	
Thomas, James..............'96	5 00	
Thomas, Oscar E............'95	5 00	
Thomas, Robert, Jr..........'96	5 00	
Thomasson, Anders ....'97	5 00	
Thompson, Albert D.........'96	5 00	
Thompson, William S........'96	5 00	
Thomsen, John J............'97	5 00	
Thorn, Henry P.............'97	5 00	
Thurston, Azor..............'96	5 00	
Tilden, Amos K.............'96	5 00	
Tobin, John M..............'96	5 00	
Topley, James...............'97	5 00	
Torbert, Willard H..........'97	5 00	
Townsend, James V.........'96	5 00	7 50
Tracy, David W.............'96	5 00	
Trautmann, Ludwig..........'96	5 00	
Treat, Joseph A.............'97	5 00	
Treherne, John C.........'95-'96	10 00	
Tremble, John E............'96	5 00	5 00
Trevitt, Cleophas A..........'96	5 00	
Trimble, Henry..............'97	5 00	
Troxler, Constantine, Jr......'96	5 00	
Truax, Charles..............'97	5 00	
Tsheppe, Adolph.............'96	5 00	
Tuma, Bruno................'97	5 00	
Turrell, Judson W.......... '96	5 00	
Amount carried forward	$5500 00	$80 00

	Annual Dues.	Certificates.
Amount brought forward......	$5500 00	$80 00
Uhlich, Ferdinand G.........'96	5 00	
Urban, Jacob P..............'96	5 00	
Valliant, George E...........'94	5 00	
Van Antwerp, Andrew... '95-'96	10 00	
Van Antwerp, Garet .....'95-'96	10 00	
Van Winkle, Abraham W.....'96	5 00	
Vargas-Heredia, Jorge.......'96	5 00	
Varney, Edward F...........'96	5 00	
Vaughan, Parry W.......... '95	5 00	
Viallon, Paul L... ....'94	5 00	
Vilter, Hermann T...........'96	5 00	
Vitt, Rudolph S............. '97	5 00	
Vockroth, Emil ....'95-'96	10 00	
Voight, Joseph F............ '97	5 00	
Vonachen, Frank H..........'96	5 00	
Vordick, August H...........'96	5 00	
Voss, George W.............'97	5 00	
Votteler, William............'96	5 00	
Wagner, Henry.............'96	5 00	
Walbrach, Arthur ....'96	5 00	
Walker, David...........'96-'97	10 00	
Walker, John P..........'96-'97	10 00	
Walker, William J........'96-'97	10 00	
Wall, Otto A................ '96	5 00	
Wangler, Conrad D.......'96-97	10 00	
Ward, A. Jae................'96	5 00	
Ward, Charles A.............'96	5 00	
Ward, George J..............'96	5 00	
Warn, William E. ....'97	5 00	
Warren, Edwin A. ....'96-'97	10 00	
Warren, William M......'96-'97	10 00	
Watson, Herbert K.... .....'96	5 00	
Watson, Sidney P............'97	5 00	
Watt, George H. ....'96	5 00	
Watters, Henry..............'96	5 00	
Waugh, George J..... .....'96	5 00	
Way, Frank L...............'94	5 00	
Webb, David C..............'96	5 00	
Webb, William H............'97	5 00	
Webber, J. LeRoy ....'96-'97	10 00	
Weeks, B. Frank ....'94	5 00	
Wehrly, Thomas M..........'96	5 00	
Weida, Charles A........'96-'97	10 00	5 00
Weidemann, Charles A.......'97	5 00	
Wells, Charles H............'96	5 00	
Wells, Edwin H..........'96-'97	10 00	
Wendell, Henry E. ....'97	5 00	
Wenzell, William T..........'97	5 00	
Amount carried forward	$5800 00	$85 00

	Annual Dues.	Certificates.
Amount brought forward......	$5800 00	$85 00
Werner, Benjamin C ....'97	5 00	
Wescott, William C..........'96	5 00	
West, Charles A. ....'96	5 00	
Westmann, Frank H.........'96	5 00	
Wetterstroem, Albert ....'96	5 00	
Wheeler, William D......'96-'97	10 00	
Whelpley, Henry M..........'96	5 00	
Whitcomb, Frederick E...... '96	5 00	
White, Richard E............'96	5 00	
Whitman, Nelson S..........'96	5 00	
Wichelns, Frederick......'96-'97	10 00	
Wickham, William H........'96	5 00	
Wienges, Conrad ....'96-'97	10 00	
Wilbur, Lot..............'96-'97	10 00	
Wilder, George P............'96	5 00	
Wilhite, Frank T............'96	5 00	
Williams, Charles F......'94-'95	10 00	
Williams, George G..........'96	5 00	
Williams, John K............'96	5 00	
Williams, Richard W........ '97	5 00	
Williams, Seward W. ....'96	5 00	
Williams, William H.........'96	5 00	
Wilson, Charles F........'94-'95	10 00	
Wilson, Frank M........ '96-'97	10 00	
Wilson, John E..............'96	5 00	
Wilson, William ....'96	5 00	
Wingate, Frank H...........'96	5 00	5 00
Winnberg, John M...........'96	5 00	
Wittmer, Joseph W., Jr...'96-'97	10 00	7 50
Wood, Alonzo F., Jr. ....'97	5 00	
Wood, Edward S............'97	5 00	
Wood, James P.............'97	5 00	
Wood, Mason B.............'96	5 00	
Woodman, Walter I..........'97	5 00	
Woodward, Brinton W. ......'96	5 00	
Wooldridge, Daniel T........'97	5 00	
Wooten, Thomas V.......'95-'96	10 00	
Wykoff, Elmer E.... .... '96	5 00	
Youngs, William.............'94	5 00	
Zellhoefer, George....'95-'96-'97	15 00	
Ziegler, Philip M.........'96-'97	10 00	
Zimmerman, Albert..........'97	5 00	
Zimmerman, Bernard.....'96-'97	10 00	
Zimmerman, Charles .....'96-'97	10 00	
Zoeller, Edward V. ....'97	5 00	
Zuenkeler, J. Ferd..... .....'97	5 00	
Zwick, George A.............'96	5 00	
Totals	$6105 00	$97 50

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

WEDNESDAY, AUGUST 25, 1897.

The Commercial Section was called to order by the Chairman, Lewis C. Hopp, at 3.30 p. m.

In the absence of the Secretary, John F. Patton was, on motion, duly seconded, elected Secretary *pro tem.*

THE CHAIRMAN: We have with us this afternoon Mr. D. R. Noyes, delegate from the National Wholesale Druggists' Association, who would be pleased to address you. If it is your pleasure, we will have him do so now.

MR. D. R. NOYES: Mr. Chairman and Gentlemen, I have been asked to speak a word of greeting from the National Wholesale Druggists' Association, and I do so with a great deal of pleasure, because I have so often had the pleasure of enjoying the kind regards that the American Pharmaceutical Association have always sent to us wherever we have met. We took our idea partly from the American Pharmaceutical Association. Among the first to send greetings to us was the American Pharmaceutical Association, and from the beginning to the end the National Wholesale Druggists' Association has never had better friends, more willing helpers and more earnest help than from the American Pharmaceutical Association.

I am not going to detain you with a long speech—I shall have the pleasure of seeing you in St. Paul to-morrow. Between here and St. Paul there is a sparsely-settled region, very unattractive, but you will have to pass through it. By looking on your map you will find it marked with a dark spot and the word "Minneapolis" near it. (Applause.) It is a dangerous place. Not long ago we had a census taken here, and a certain number of people were found in their homes and in their different vocations in our sister city of Minneapolis, and a week later twenty thousand of those people had disappeared. They have never been seen or heard of since. There has never been a word from them, and I warn you, therefore, not to get off the cars unless you are under the safeguard of some entirely reliable friend.

A year ago in Richmond one of our friends, speaking of Minneapolis, said that Minneapolis doubled her population every year. (Laughter.) That was pretty good, but as I was the next speaker I had the pleasure of getting back at him by saying that to my certain knowledge the population of Minneapolis was doubled every time a Minneapolis man spoke of it. (Prolonged applause and laughter.) Now, there are plenty more, but

I have not time. I merely want to say that we have a splendid city near this lake, nearer than ours, and we have a common interest in the same, as we have a common welcome for you all. You have a grand city, larger than St. Paul, and the best, the most promising, with one single exception, in the northwest. (Laughter.) Gentlemen, you have come here for business, and this is the Commercial Section. If I thought for a single minute that I could have made $500 this afternoon I should not have stayed here as long as I have. An old gentleman from New York, riding up here with me on the train, I said to him, "How are you feeling to-day?" and he said, "I am not feeling very well," and I said "Can't you take something—can't you do something?" "Well," he said, "if I could have made $25,000 this afternoon, I would feel first-rate." Now, I hope that you will all find some way of accomplishing this same result, and then in remitting it more rapidly to your wholesale friends (laughter), and with the present fine prospects of a large crop and something like dollar wheat—there are two things that I told over at the State Association meeting yesterday, one was that I never expected to see a full meeting of the Minnesota State Pharmaceutical Association, and I never expected again to see dollar wheat, but I have seen it—you can all afford to pay a cent advance on your bread for the sake of knowing that you are filling the pockets of us gentlemen here who need it so badly, and are just merging into the sunshine, as we hope you all are. (Applause.)

Chairman Hopp then delivered the following address:

Gentlemen: This is my first appearance before you as Chairman of the Commercial Section. I was not present at the meeting of this Section at the Montreal meeting last year, and was greatly surprised when entering the hotel, after the Section had adjourned, to have members of this Association come to me and ask where I had been, congratulating me and telling me I now had the opportunity of my life. On inquiry, was told I had been elected Chairman of this Section. Now, gentlemen, this placed me in a predicament; for shortly after, another member, with congratulations, remarked:

"Well, you see, Hopp, it's this way: The members get so much science in the 'Scientific Section,' and such an abundance of education and legislation in the 'Educational and Legislative Section,' that they must reserve some part of the meeting for fun, and the 'Commercial Section' is where they get it."

These remarks gave me something to think of. I enjoy fun, but, gentlemen, let me tell you, the commercial side of pharmacy is not play, and this "Commercial Section" must be the foundation stone of this Association; the "pillar of support" to the Scientific, Educational and Legislative Sections. The majority of our membership is composed of men compelled to battle in a commercial way, and it is through and by them that our Association gets its sustenance; thus enabling this Association to publish a report of its proceedings which is the peer of any similar report published in the world.

Some time since one of the Pharmaceutical Journals sent out a circular in reference to the abolishment of this Section, and requested written opinions for publication; almost all of the opinions for its discontinuance are based on the "Cut Rate" problem, because this Association did not, through this Section, succeed in upholding prices and succeed in keeping these same nostrums out of "General or Department Stores."

The trouble with this Commercial Section, so far as I can see, is that it has been allowed to get into a rut, just as a retail druggist is apt to do if he is neglectful of his business. This Association got into the "Cut Rate" rut, and has been in it from the first meeting after its formation until this present time; in fact, it was fed on cut rates, and it is a wonder to me it has lived as long as it has.

What have we to do with nostrums? What are they? We don't know. A firm puts up the complex thing, as a public cure-all, and charges $8.00 per dozen for a bottle that retails at $1.00. It is something that cures a corn on the little toe or the bump on the

bald head. These nostrums are one of the outside conditions of our business; they have come to stay, and we must meet that condition. Before this Section adjourns we will probably hear more or less regarding a circular issued by a well-known "malt extract firm," containing a plan to stop cutting of prices; one of said committee is an honored member of this Association, and will speak for himself. "They builded better than they knew." This is, I believe, the motto of the N. W. D. Association, which motto, I take for granted, referred to the inauguration of the rebate plan or the signing of a contract by the jobber who agrees not to cut the wholesale prices of the manufacturer. If a jobber will not sign such a contract, he cannot secure the goods. Now, if they will only go a little farther, provided both manufacturer and jobber are sincere, and make said contract read that the jobber must secure a contract from the retailer before he sells to him, a similar promise that he will uphold the minimum price placed on the goods by the manufacturer, a step farther may be taken.

Trade Marks and Patents. This question should be taken up by this Section *vigorously* and *energetically*. We should not give the subject oue moment's rest until the obnoxious part of "Trade Mark and Patent Laws" referring to medication is changed in such a manner that pharmacists will no longer be imposed upon.

Such preparations as Phenacetine, Sulfonal, Trional, etc., monopolistic products from Europe, outrage every citizen in this country. This Section should formulate some plan, not a set of resolutions but a practical plan, and present it to each State Association, with the request that they appoint a committee from each State; also, enlist the National Medical Association and the various State medical associations to go to Washington prepared to have obnoxious sections of the "Trade Mark and Patent Laws" changed. Of the 30,000 druggists in this country, fully 15,000 of them will be willing to give, at the lowest, $1.00 apiece towards the honorable enforcing of our claims. This fund should be collected by and through the various State Associations and, by them, turned over to a committee appointed by this Association having this matter in charge, to be used to pay legal and committee expenses. Said committee should have full power to issue whatever circular may be necessary and employ attorneys and lobbyists as they deem best.

This Commercial Section should give the matter of the revision of the Pharmacopœia closer consideration than has been done heretofore from a commercial standpoint. This valuable work from a scientific point of view is considered perfect for the present time, but pharmacy has a commercial side not altogether in accordance with science. No doubt eliminations and additions can be made, and if made with a commercial idea in view, this work will become much more popular. This Section should also consider the standard valuation of drugs and of their preparations. The Pharmacopœia is all right viewed from a scientific point of view, but it is altogether too exacting from the commercial. I advise that we recommend the adoption so far as possible of limits of valuation, minimum and maximum.

The 50 per cent. tincture question has been brought up before this Association for a number of years, yet nothing has been done towards their adoption. Scientific men, after more or less discussion, will state that it is too radical a change, and we should wait until more or less demand is made for them. I would like to know how are we to have such a demand made? The manufacturers surely will not make an effort to introduce such preparations, for thereby they will lose one of the best arguments they now have for the factory-made extract. To the retailer they—some at least—will say: "You can't possibly extract your drug so thoroughly and cheaply as we, for you must work small quantities and we make from 50 to 100 pounds at a time;" to the physician they use the argument: "A retailer cannot make one or two pounds and extract all the virtue out of a drug as do we, the mauufacturer; for we work up 100 pounds at a time." With 50 per cent. tinctures every retailer can in a majority of cases exhaust the

drug thoroughly; besides he can and will take particular pains to make them, knowing there will be no great loss of alcohol as is the case in the making of fluid extracts. Another point is, these preparations can readily replace the present tinctures of the Pharmacopœia if only for the extra convenience of uniform medical strength. With 50 per cent. tinctures every physician will be able to write his prescription for tinctures based on the drug dose, and he will not be bothered with the drug strength of the tincture as at present where they vary from 5, 10, 15, 20 to 50 per cent. Of what use is it to the physician to know the dose of the drug when he has forgotten or probably never knew the drug strength of the tincture? I have frequently put up prescriptions written tinct.—so to make a given quantity of the drug in each dose, thus showing that the doctor did not know whether tinctures were 5 or 10 per cent. He wanted a tincture, not a fluid extract, and he wanted to give a specific amount of the drug. It will also be of great value to colleges of Pharmacy, and particularly to students. It will relieve them of trying to retain the particular amount of drugs in tinctures made according to our present Pharmacopœia.

The statement has been made that the Pharmacopœia cannot introduce articles or preparations until they have become of sufficient or known value. Who is to introduce them! Is it not the manufacturer? Is it not true that a *manufacturer's name* clings to such a preparation after it is adopted by the Pharmacopœia? And how does the manufacturer introduce it? By *printer's ink*. Now, that is what this Section should do: insist on the adoption of 50 per cent. preparations, formulate a circular, send it to the various State Associations, and through them they will be distributed to the retailer and physician. Also instruct the delegates to the American Medical Association to introduce the clause advocating such preparations.

From a commercial standpoint this Section should urge the Section of Legislation to bring about the interchange of "Certificates of Registration" by State Boards of Pharmacy. The non-interchange is not so much a hardship as an annoyance, frequently preventing a pharmacist of one state from employing a first-class man residing in another.

I will give an example: A New York pharmacist, registered by examination, is out of a position and finds it impossible to get a situation in his own State; however, he has an offer from Cleveland, O., which he accepts; this we will say occurs in November; upon his arrival he finds the Board had met early in October and the next meeting of said Board will be held in Cincinnati the following January, or two months after his arrival in Cleveland; he must then travel 254 miles to be examined and after that wait two or three weeks for the Board to finish examining the papers—all this time, nearly three months, according to the strict letter of the law, he cannot practice pharmacy in Ohio. Gentlemen, this is not only an annoyance, expensive, but a hardship, and this Section, I hope, will take this subject up and secure interchange of certificates, so that this state of affairs can exist but a short time.

Gentlemen, I thank you for your kind attention and await your further pleasure.

On motion of Mr. Stewart, seconded by Mr. Hassebrock, it was voted to refer the address to a committee of three, and that the thanks of the Section be extended to the Chairman for his most excellent address.

The Chairman appointed Messrs. Stewart, Ebert and Good as such committee.

THE CHAIRMAN: As we have no reports of committees, the reading of papers will be next in order, if the members present have any papers to read. The following has been referred to this Section by the General Session:

LOUISVILLE, KY., *June* 15, 1897.

MR. CHAS. CASPARI, *Secretary American Pharmaceutical Association, Baltimore, Md.:*

Dear Sir:—The Proprietary Section of the National Wholesale Druggists' Association, recognizing the unfortunate condition that exists in the retail drug business of the country (due largely to the forced evil of selling goods at cost), and at the same time recognizing the fact that this condition reacts in a large measure against the interest of the manufacturer by causing, in some instances, druggists to unfairly substitute when popular staple and advertised remedies are called for. Therefore our Association, believing that a better understanding should exist between the manufacturer and the retailer, appointed at their last meeting in Philadelphia a committee known as the Committee on Fraternal Relations, whose duty and pleasure it will be to confer and co-operate with a like committee from each state pharmaceutical association and all kindred organizations; as it is believed by earnestly working together, with a single object and one end before us, many differences may be adjusted, existing evils corrected, and thus by combined efforts we can hope to harmonize, protect and advance our mutual interests.

Sincerely trusting that your honorable body will give this question your serious and favorable consideration, with best wishes for the success of your meeting, I am

Fraternally yours, GEO. A. NEWMAN,
for the Committee.

MR. EBERT: I move that the paper be received.

The motion was duly seconded and prevailed.

MR. EBERT: I want to say, Mr. Chairman, that it seems to me these plans that are suggested for relieving the retail druggists ought to be stopped, because they are simply promises. The manufacturer can stop the depreciation of the price of his goods if he desires. (Applause.) My name, unfortunately, has been associated with a plan which was sent out by one of these proprietors, and my name was attached without my having seen the paper. The plan that was submitted by the different writers was submitted to the committee and all that we could do was to take those plans and make a digest of them and possibly make a plan out of the same and present it. The remarks, however, that were made in the report I knew nothing about and I do not know who drew it up, and, of course, I am not responsible, excepting that my name was attached to it and I couldn't help it. I hope it will never occur again.

But now, I want to say right here, that I have a plan to submit to the proprietors—to the Association of Proprietors, whatever their title is. Now, these gentlemen, to start with, manufacture merchandise upon which they fix an arbitrary price. That price, usually allows them certainly a large percentage, by which they can carry out any plan that they are willing to take up and put into effect. They also fix the retail price usually. Now, are they in earnest to see that the distributor to the people will receive that price? That is the question. If they are in earnest, if they wish to protect us, they can do it without any trouble whatever. I will tell you how they can do it. What I intend to say is rather crude, but I think a plan on that basis can be worked out, provided the proprietors of these goods are in earnest.

They distribute their goods to the distributors, who usually are in the large cities and who are the jobbers and wholesale druggists. Now, sir, if these gentlemen will come together and place a depot at every one of these distributing points, deliver their goods there and sell them from that depot—a quarter of a dozen or a gross, as it is wanted—to a retail druggist, or to a wholesale druggist, they can take care of their goods and their prices in that way. In this way, if the retailer buys the goods from the depot, let him pay the same price that he would pay the jobber. Let that little percentage which they give the jobber help to sustain the expenses of the depot. If, however, the retailer

buys from the jobber or through the jobber, let them pay the jobber the same percentage that they are paying him now. They can by that means regulate it so that the one who is the distributor will buy the goods at the same price that everybody else buys them. They can regulate this with marks or whatever system they may have, so that they can cut off the supply of any one who cuts the price of those goods below the price that they have fixed for them. The wholesaler makes the statement that these nostrums or these proprietary remedies are the bane of his business; that they fill up his shelves and use up his capital, and that he really gets no recompense for handling them. If that is the case he will be only too glad when he has an order for a dozen, or is supplying himself with a couple of dozen, to send down to that depot and get his supply there. He does not have to carry it on his shelf. He does not have to engage a large amount of capital in these goods, and he will be only too glad to assist the Proprietary Association.

Now, what is the inducement offered by these gentlemen, these proprietors? I will give you one, and that is why this idea came to me. Only about a month or two ago a representative of Castoria came into my store and said, "Mr. Ebert, you sell nothing but the genuine Castoria?" "No, that is all I have on the shelf." "How do you sell it?" "I sell it at the regular price." "Well, now, Mr. Ebert, we are glad to meet men like you; we want to do something for you." "Well, sir, I would be very glad to have it done." (Laughter.) "We want to sell you a gross of this now, and we will give you enough of the Castoria so that it will cost you $2.40, and then you can sell it at 25 cents." "Then," I said, "you want to make a cutter out of me right away. What advantage is that to me?" "Well, you can meet the price." "Well," I said, "you want me to make a price below that of my neighbor who would not be able to buy a gross, and in that way undersell him? You go back to your people and tell them that I am not in that kind of business." (Applause.) Now, gentlemen, that is the only solution of it. The proprietors can make a price, an arbitrary price which they demand from us, and if they make an arbitrary price for their goods, we must insist upon their seeing that that price is obtained when the retailer sells it to the customer. They can do it.

MR. SHEPPARD: Do I understand rightly that the communication that was read requests us to appoint a committee on fraternal relations, to confer with a committee appointed by the Proprietary Association? That was the idea I grasped when listening to the paper. I believe we ought to appoint such a committee. This Association is a representative body, and the idea of fraternal relations is so strong that we should not ignore the request for an appointment of the committee; and, therefore, I move that the officers of this Section be appointed a Committee on Fraternal Relations, to act with a similar committee appointed by the Proprietary Association.

Motion seconded.

THE CHAIRMAN: Is there any member of the committee here, of the Wholesale Association or of the Manufacturers?

MR. SHEPPARD: That I do not know.

A MEMBER.—If the Manufacturers' Association is so much in favor of establishing better relations, I think at least one of the committee should have given his time to this meeting and explained to us what the Manufacturers' Association intends by this letter. If a committee has been appointed by that association and we appoint our committee, it will be a year before we can get together, and I think that now is the time for the Manufacturers' Association to be on hand in order to know what plan to establish for better relations. The Proprietary Association meeting takes place in October.

MR. EBERT.—I want to say that there is no use in doing this. I am getting tired of

it. This Association has sent delegates to their meetings and they have paid the money out of their own pockets to go. We have met this Proprietary Association time and time again. When we go there they tell us, "Gentlemen, help yourselves." Now, I just say to you that they have been dallying and dallying with us. This cutting is what is hurting them, it is simply cutting their goods out of existence, and these pharmacal organizations that are starting up like the Minnesota Association and the Illinois Association will drive their goods out of existence. Now is the time. Let them come up and show that they mean what they say. When we went to Montreal we begged them and we asked them to do what they have done for the Wholesale Druggists, and all they said was, "Gentlemen, God helps those that help themselves," and we have been helping ourselves ever since, and I say that appointing a committee to confer with them simply puts if off. Jut say to them, "Gentlemen, you make a plan and submit it to us, and then we will appoint our committee."

MR. WHITNEY: Mr. Chairman, possibly I may throw a little light upon this question by citing a little of my own experience which Mr. Ebert's remarks called to my mind. The representative of one of these proprietors came to me some time ago with an article, the wholesale price of which was four dollars a dozen, and the wholesaler was permitted to sell a gross lot at ten per cent. discount or a half gross lot at five per cent. discount. This representative came to me and said, "I am anxious to put a lot of goods into your store." I said, "What have you to offer?" He says, "If you will give me an order on one of the wholesale houses you may have half a gross with a ten per cent. discount." I suggested the house that I was in the habit of purchasing of. He said, "No, that house will not do it. They wouldn't give you but five. You send your order to another house, such as I select, and you will get ten." I said, "That doesn't amount to ten." He said, "I'll send you direct from the house half a dozen extra, and I will leave you cash enough so that the goods will cost you $2.62 a dozen." I took the bait. (Laughter.)

MR. HAMMER: Mr. Chairman and gentlemen, I wish to say that we have had the same difficulty in our Association time and again. We came to the conclusion that there was no use talking with the proprietary companies. We organized in our state what we call the Wisconsin Pharmacal Company and are preparing our own prescriptions, and I believe, candidly, by working and pushing our own goods, that, sooner or later, these proprietary companies will come to us, and we should not go to them; and I say that the stand the American Pharmaceutical Association should take is to put their shoulder to the wheel and let every association work, and I think it will only be a few years before we accomplish what we are working for.

MR. SIMMONS: Mr. Chairman, I believe that if the druggists of the different states would follow out the plan of the Wisconsin and the Minnesota Pharmaceutical Associations, who are manufacturing goods for themselves, and then go to work and fortify it with a plan of buying patent medicines and selling them only where you have to, and then sell them at cut rates—when a man asks for them never pretend to ask a dollar for them, but sell them for $0.69 or something of the sort—you will soon kill out the proprietary men and they will come to us with entirely different propositions. Cut the life out of them! When a man comes into your store and wants a certain patent medicine, and tells you that he can get it at a certain price at the department store, sell it to him at the same price or even less, but, at the same time, try to sell him your association goods. In this way you will save your trade and your customers will stay by you.

MR. EBERT: I would move that the communication be placed on file.

The motion was duly seconded and prevailed.

MR. WHITNEY: I think if the manufacturers have seen the error of their way and want assistance in finding some way out of the difficulty, and we, in our wisdom, can assist them, I think it would be wise to do so. If we cannot trust them, all right, let the matter drop; but, if a child comes penitently and asks forgiveness for doing wrong, the natural tendency of the human heart is to give him a chance. Now, if they have found that their method is disastrous, and we receive a letter from them, intead of ignoring the matter it strikes me it would be wiser that we write them saying that their communication was received, read, and action deferred until they made such proposition as they saw fit to submit; and then the committee could receive that communication and report at our meeting, or, perhaps, formulate such a plan if, in the judgment of this Section, it was thought desirable. I don't think it should be thrown in the dust. It is not the way we would like to have them do to us, and I have found it a pretty good rule to "do unto others as you would that others should do unto you."

MR. EBERT: Mr. Chairman, we have had an invitation from them several times similar to this. We sent delegates to their meeting; I went all the way from Chicago with a gentleman from Kansas City and another from Montreal, at an expense of about $75 to myself, to meet those gentlemen on the same proposition that they make to-day; and I say to you gentlemen, that after we got there they made us this proposition, that we help ourselves. They have done this year in and year out, simply because we have been their distributors. Now, I say for them to make us a proposition—don't send letters like this. They want to help the druggist! They do help the druggist—yes, by selling their goods to the department stores of this country—every single one of them, without any exception. Maybe they don't sell them direct; you probably couldn't find the name of Siegel, Cooper & Co., or the names of any of those other large houses who can buy in ten and fifteen gross lots, and then slaughter the price of the goods; but it is "sold to John Smith"—a myth. Now, I say, write openly to these gentlemen, propose your plans, submit a plan to the retail druggists of this country, and we will consider it; and if it is fair to us we will accept it: but don't be dallying with them. (Applause.)

MR. SHEPPARD: Mr. Chairman, I desire to make the motion that the Secretary be instructed to communicate to the secretary of the Association from which this communication was sent, that their communication was received, but that we did not deem it desirable to appoint a committee.

The motion was seconded and agreed to.

MR. THOMPSON: Mr. Chairman, I want to say a word upon this matter in relation to the Proprietary Association, although it may possibly be out of order. I was on a committee some years ago, representing this Association, to meet with a joint committee of the Wholesalers' and Proprietors' Association. I met with those gentlemen in New York, and instead of receiving unkind treatment or unfair propositions, I never met with better treatment or heard better expressions of friendship than I heard at that meeting. A plan was agreed upon at that meeting to meet this difficulty of remedying cut prices. In the first place, I may say, before I agreed to have anything to do with it, I wanted to know if they admitted that the cutting of prices ruined their business. I said I didn't come there to represent the retail druggists as traders to be helped by them, because we could help ourselves. When they admitted that they were being just as much injured by the cutting of prices as the retailer, why, then I was willing to work with them. The plan which we agreed upon was to be submitted to the retail druggists, to ascertain whether they approved of it. They wanted to get a plan to accommodate the druggists, and no matter what happened, unless it met with the approval of the retailers, it was no benefit to them. I had no authority to expend any money for this purpose and told

them so, whereupon two of the proprietors who were there on this committee offered to supply the money for this Association to take that census. Now, this proposition came from the retailers themselves. There never was any objection made to it by the proprietors or the wholesalers, and from the experience I had then it leads me to think that whenever yon get a plan that is strong enough to make a retailer, and every retailer, sell his medicine at a certain price, you will have a plan that he will be the greatest kicker against himself.

MR. RYAN: Mr. Chairman, if it is in order, I would like to bring up another subject which is perhaps visionary, but still it is different from the cut rate, and it is this: I believe that all matters need to be agitated, that is, matters of large moment extending over quite a surface, before somebody finds the right way to bring them about. There is one question that the retailers are troubled a great deal with in my section, and I suppose the country over. We have left on our hands a great many old patent medicines. That is, they get old because in one section of the country they are unsalable and in another sec ion are salable. Now, is there any way of remedying that evil? I want simply to bring this question up here for discussion and agitation. I confess that I have no plans, although, of course, any one could suggest a number of ideas on the subject. The only thought that I have had that is worthy of consideration on this subject is that possibly if there was concerted action throughout the United States, there might be three or four central clearing houses established—patent medicine clearing houses—to which all the retail druggists could send, if they chose, their old patent medicines, because a proprietary medicine that is salable in one part of the country may be unsalable in another, and if they were sent there at the expense of the owners and there held at their expense until they were called for at perhaps ten per cent. less than the market price, no doubt something might come of it.

Dr. Stewart, chairman of the Committee on Chairman's address, here submitted the following report:

1. While we consider that the nostrum business is outside the pale of legitimate pharmacy, we approve of the adoption of some plan to prevent cutting of prices. Inasmuch as the sale of nostrums by pharmacists seems to be a necessary evil at present, we think the chairman's suggestion to adapt to the retail drug business some modification of the rebate plan as it now exists between the jobber and manufacturer of so-called proprietary medicines is a good one.

2. On the subject of patents and trade-marks as applied to medicine, we recognize that the object of the patent law is to promote progress in science and the useful arts by granting to the inventors, for limited times, the exclusive use of their inventions in exchange for the publication of exact knowledge concerning them, and not the creation of unfair monopolies: And the object of the trade-mark is to enable the public to distinguish between one brand of an article and another brand of the same article sold under its commonly accepted name, and not to create monopolies by permitting the ownership of the only names by which medicines are known. We, therefore, agree with the chairman that the American Pharmaceutical Association should not cease in its efforts to bring about a proper interpretation of these laws by the courts, and then modification, if necessary, to properly carry out their object.

3. It is doubtless true that some of the tests for chemicals in the Pharmacopœia are unnecessarily rigid, and that in many cases an article may be medicinally pure without meeting these exacting requirements.

4. In the matter of the preparation of fifty per cent. tinctures, we think that this Association cannot take the initiative. The recent decision of the American Medical Association was against their introduction.

5. We suggest that the matter of the interchange of certificates of registration by State Boards of Pharmacy be referred to the Section on Education and Legislation.

F. E. STEWART,
A. E. EBERT,
J. M. GOOD,
Committee.

MR. THOMPSON: I move that the report of the committee be received and the recommendations be adopted.

MR. TORBERT: Mr. Chairman, I would like to know how that could be? We have already passed a motion here that we do nothing in appointing a committee concerning the manufacturer. The address recommends a consideration of that question, that is, the question of devising means to prevent the cutting of prices of proprietary medicines, and by adopting the report we adopt that recommendation, and the two positions are antagonistic. I only desire that the action of the Association with reference to these propositions shall be consistent.

MR. GOOD: In that report, of course, we are obliged to say that we could not write that report and be cognizant of what is going on here. I will state, however, that we considered the suggestions of the chairman and concluded that if some modification of the rebate plan, as it was now in existence between the jobber and the manufacturer, could be adopted so as to protect the retailer, it would be a good thing, and I don't know that we need necessarily interfere with any resolutions that you have passed.

The motion of Mr. Thompson was seconded and prevailed.

THE CHAIRMAN: The next business in order is the election of officers for the ensuing year. The Committee consists of five gentlemen, a Chairman, a Secretary, and three associate members.

MR. EBERT: If nominations are in order, I nominate for Chairman Mr. Joseph Jacobs of Atlanta, Ga. (Nomination seconded.)

MR. MAYO: I nominate Mr. J. H. Bobbitt, of North Carolina, for Secretary. (Seconded.)

THE CHAIRMAN: Three associate members still remain to be nominated.

MR. MAYO: I nominate Mr. Kuhn, of Omaha. (Nomination seconded.)

MR. DUNNING: I nominate Mr. E. C. Bent, of South Dakota. (Seconded.)

MR. DEWOODY: I nominate Mr. Hassebrock, of St. Louis. (Seconded.)

On motion, duly seconded, nominations were closed.

MR. STEWART: I move that the Secretary cast the ballot for the gentlemen nominated. (Motion seconded and prevailed.)

This duty having been performed by the Secretary, the Chairman declared the above-named gentlemen elected to the respective offices.

THE CHAIRMAN: I will appoint a Committee of two, consisting of Mr. Holmes and Mr. Holzhauer, to conduct the new officers to the platform.

Mr. Jacobs, having been escorted to the platform and introduced by the Chairman, responded as follows:

Gentlemen, I do not see why I should be selected as Chairman of the Commercial Section; in fact, I have rather been at variance with what I understood to be the object of the Commercial Section. I think you have made a mistake. I have my own views in reference to the manner in which the drug business should be conducted; I have it in common with quite a number of others who have made a partial success of the drug business, but it does not seem to agree with your views. It puts me in a peculiar position. If I accept, and I am loath to accept, it is difficult for me to know how to proceed. You will hardly expect me to change my views—they are too well grounded. I think you have made an arch cutter chairman of the Commercial Section, and a fellow who is proud of being a cutter.

MR. MAYO: We thought that would settle the cute-rate question.

MR. JACOBS: No, no; I hardly understand this. It would not settle the cut-rate question at all. If you intend to kill the Section you are going at it in a proper manner (laughter and applause) but I think it would probably be better to vote to disband the Section at once and be done with it.

Mr. Bobbitt was next introduced by the Chairman.

MR. BOBBITT: Mr. Chairman and gentlemen, it was a surprise to me that you should elect me Secretary of this Section, but, as the duties of the office are clerical, I will accept the same and will try to discharge them to the best of my ability.

Mr. Bent was conducted to the platform by the Committee and introduced by the Chairman.

MR. BENT: Mr. Chairman and gentlemen, I just wish to say that I thank you for the honor conferred upon me, and that whatever the duties are I will be very glad to perform them as faithfully as I can. Again I thank you. (Applause.)

Mr. Hassebrock, having been introduced by the Chairman, thanked the Convention for the honor conferred.

MR. STEWART: Mr. Chairman, I move that a vote of thanks be tendered to the retiring Chairman of this Section, and to the other retiring officers.

Motion seconded and prevailed.

Upon motion of Dr. Stewart, duly seconded, the Section adjourned, subject to the call of the Chair.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION—THURSDAY, AUGUST 26, 1897.

The Chairman, Mr. Wm. C. Alpers, called the Section to order at 9:45 a. m. in the following words:

Gentlemen, I regret to be compelled to announce that the Secretary of the Section, Dr. Coblentz, is in Europe, and that our Associate, Prof. Scoville, of Boston, did not come to this meeting; it will, therefore, be necessary to elect a Secretary *pro tem.* for this Section.

On motion of Mr. Good, seconded by Mr. Beal, Geo. B. Kauffman, of Ohio, was duly elected temporary Secretary.

THE CHAIRMAN: The next order of business is the reading of the Chairman's Address. I have the address ready if you wish to hear it, but I should prefer to postpone the reading of the address until to-night, for the reason that I have touched on many subjects which I especially desire those who believe in the commercial side of pharmacy to hear. I have spoken of them in very strong and pointed terms, and would, therefore, consider it a favor to myself and also, I believe, to the members in general, to have the reading of the address postponed if it is your pleasure to do so.

On motion of Mr. Good, duly seconded by Mr. Helfman, the reading of the address was postponed until evening.

THE CHAIRMAN: The next business is the report of the committees and the appointment of such new committees as may be desirable. There are to my knowledge two committees that ought to report to-day. One is the Committee on Indicators. The report of this Committee is here.

MR. CASPARI: Mr. Chairman, as a member of that Committee, I would say in connection with this report that the Committee was continued last year at Montreal, as you will remember, and the Chairman, Mr. Kebler, and Prof. Lloyd have gone over some of the work reported by them last year, confining the work to fluid extract of coca leaf and powdered coca leaf, with the view of securing more concordant results. As this is

wholly a statistical report I will not read it in detail; and now, if it meets with the approval of the members present, we will consider the report as having been presented.

MR. GOOD: I move that the report be received and that it take the usual course.

Motion seconded and prevailed.

REPORT OF COMMITTEE ON INDICATORS.*

Mr. Chairman, and Members of the Association:

The third report of the Committee consists of some results obtained by two of the workers who were dissatisfied with some of their data in last year's report. Prof. J. U. Lloyd, and the Chairman, after comparing their results reported at the Montreal meeting, decided to repeat the work for coca leaf and its fluid extract. This, it was concluded, should be done on about the same date and in the same manner. The Chairman prepared the material, and forwarded it with instructions.

FLUID EXTRACT OF COCA LEAF.

For assaying this preparation, the directions of the Chairman of the Committee as reported in the Proceedings for 1896 were adhered to, employing, however, enough of the fluid extract to make six or seven determinations from the same extraction, so that there would be no source of error here. Titrations were executed only with chlorophyll-free (nearly) alkaloids, using the most satisfactory indicators, viz: Brazil wood, cochineal and hæmatoxylin.

The results reported by Lloyd and Kebler last year on fluid extract of coca were as follows:

	Lloyd.		Kebler.	
	Gravimetric.	Volumetric.	Gravimetric.	Volumetric.
Brazil Wood	0.48	0.34	0.53	0.35
Cochineal	0.57	0.29	0.55	0.40
Hæmatoxylin	0.53	0.27	0.54	0.38
Lacmoid	0.60	0.35	0.50	0.38

While all their other results agreed quite closely, this portion was considered unsatisfactory.

On assaying the second fluid extract, November 7th, the results were as follows:

	Lloyd.				Kebler.			
	Using Alcohol.		Excluding Alcohol.				Using Alcohol.	
	Grav.	Vol.	Grav.	Vol.	Gravimetric.		Volumetric.	
Brazil Wood...	0.406	0.328	0.36	0.323	0.369	0.416	0.277	0.289
Cochineal	0.37	0.290†	0.412	0.298†	0.416	0.416	0.277	0.286
Hæmatoxylin..	0.406	0.315	0.376	0.321	0.384	0.370	0.290	0.293
Average.......	0.394	0.311	0.383	0.314	0.389	0.401	0 281	0.289

The average of Lloyd's gravimetric results is, 0.388; of Kebler's gravimetric, 0.395; difference, 0.007 per cent. The difference of the volumetric results is 0.027 per cent.

ASSAY OF POWDERED COCA LEAF.

Since the mode of procedure is contained in the report of the workers, the directions will not be repeated here. Prof. Lloyd reported his work as follows: 50 Gm., of powdered coca, not previously dried to constant weight, were put into a half-gallon bottle and covered with 500 Gm., of chloroform-ether (1 to 3) mixture; after five minutes' ro-

* See also Reports of Committee p. 185, Vol. 43 and p. 109, Vol. 44.

† Change of color indistinct except when adding more of the indicator than prescribed.

tating, 50 Gm. of 10 per cent. ammonia were added and the bottle shaken for two hours, almost continuously, occasionally cooling the bottle in cold water. Then 50 Gm. more of 10 per cent. ammonia were added, well shaken, and finally seven times 50 Gm. of the ethereal fluid drawn off. Six of these were assayed, with the results as follows: (Probably it was case "F," where some difficulty was experienced in pouring off 50 Gm.)

		Gravimetric.	Volumentric.
Hæmatoxylin	A.	1.102 per cent.	1.00 per cent.
"	B.	0.994 " "	0.957 " "
Cochineal	C.	1.038 " "	0.950 " "
" 3 drops	D.	1.096 " "	a–0.927 " " b–0.982 " "
Brazil wood, 50 drops	E.	1.002 " "	0.952 " "
" " 10 "	F.	0.944 " "	0.897 " "
Average		1.029 per cent.	0.952 per cent.

In case "D" it was attempted to see what effect the exclusion of alcohol would have on the results. The visible effect is that it is difficult to dissolve the alkaloid completely from the resinous material. After volumetric results were found too low (see "a") the same determination was continued by adding an equal bulk of alcohol, which caused an increase in the results. (See "b.")

In these experiments the titrations were carried out in the same beaker in which the gravimetric results were obtained. The varnish-like residues were dissolved in five Cc. of alcohol, two Cc. $\frac{N}{10}$ sulphuric acid and ten Cc. of water were added, then the indicator and the excess of acid titrated back with $\frac{N}{100}$ potassium hydroxide. In each case, one Cc. $\frac{N}{10}$ acid was added again, and the excess titrated back with centinormal potassium hydroxide.

Hæmatoxylin and cochineal gave sharp changes of tint; also Brazil wood; but the latter indicator requires a trained eye to see the change plainly. However, the solution may have deteriorated.

Mr. Kebler proceeded exactly as did Prof. Lloyd, except that the shaking was intermittent instead of continuous—shaking about every 15 minutes during two hours. His results were as follows:

	Gravimetric.	Volumetric.
Brazil wood	0.96	0.87
Cochineal	0.92	0.887
Hæmatoxylin	0.97	0.893
Average	0.95	0.883

The difference here amounted to: gravimetric, 0.079 per cent.; volumetric, 0.069 per cent. These variations appeared too great; so it was decided to do the work in a reverse manner: that is, Prof. Lloyd apply less agitation, and Mr. Kebler more. Prof. Lloyd, by reducing his shaking to three-fourths of an hour, and Mr. Kebler, by agitating two hours continuously, with the same coca leaf obtained results respectively as follows:

	Lloyd.		Kebler.	
	Gravimetric.	Volumetric.	Gravimetric.	Volumetric.
Brazil wood	1.034	0.950	1.02	0.91
Cochineal	1.004	0.939	0.99	0.89
Hæmatoxylin	0.976	0.934	1.03	0.94
Average	1.005	0.941	1.01	0.91

On comparing these results with those obtained above we come to the conclusion that time of agitation does seem to increase the percentage of alkaloidal yield to some extent, and this fact should be borne in mind when parallel assays are made. While the above data are not in complete accord, yet they approximate one another as closely as can be expected for this character of work, and are considered quite satisfactory by the workers.

LYMAN F. KEBLER, *Chairman.*

THE CHAIRMAN: The other Committee that should report to-day is the Committee on Scientific Research. I am a member of that Committee, and I would say that the report is ready, but it is in the hands of the chairman Prof. Prescott, who is absent, so we cannot submit it now. The next business in order is nominations for new officers of the Section.

On motion of Mr. Caspari, the reading of the Report of the Committee on Revision of the Pharmacopœia, which was referred to this Section at the second general session of the Association, was also deferred until the evening session.

Edw. Kremers, of Madison, Wis., and Wm. C. Alpers, of New York City, were nominated by Messrs. Caspari and Good respectively for the office of chairman of the Section for the ensuing year. The nominations were duly seconded.

THE CHAIRMAN: The nominations for Secretary are now in order. I would urge you to select a Secretary who will be sure to attend the next meeting.

Mr. Kauffman, having been nominated for the office of Secretary, asked to be excused on account of other duties, but was urged by Mr. Good and others to allow his name to stand.

THE CHAIRMAN: The next business is the reading and discussion of papers.

MR. CASPARI: If it is in order, I would suggest that the reading of papers be postponed, unless the authors are here to read them.

MR. BEAL: If any papers have been sent here, the authors of which are not present at the meeting, would it not expedite matters to read these by title?

THE CHAIRMAN: I have a list of such papers. They can be read now by title and disposed of, but of course the other papers that I have here had better be laid over for a later session. If you so desire, I will read the titles; they are:

Standards for Linseed and White and Black Mustard Seed, by J. U. Lloyd.

Comparative Structure of Hyoscyamus, Belladonna and Stramonium Leaves, by J. O. Schlotterbeck.

Examination of Powdered Vegetable Drugs, by Henry Kraemer.

Sulphur Precipitatum, by T. D. Reed.

Is Glucose or Grape Sugar of any Value as a Preservative in Syrup of Hydriodic Acid and Syrup of Ferrous Iodide? by David Walker.

Gelsemic Acid, by V. Coblentz.

Selenium in Commercial Sulphur, by T. D. Reed.

The Effect of Temperature upon Percolation, by H. DeForrest Smith.

Chemical Bibliography of Morphine, by A. B. Prescott and H. E. Brown.

The Chemistry of Cascara Sagrada, by A. R. L. Dohme.

The latter paper was to be read here. I mention it now as probably there will be no

chance to read it, for we have to give those papers the preference the authors of which are here. I would like to ask the Section a question in relation to the paper by H. De-Forrest Smith, "The Effect of Temperature on Percolation." The paper was sent to me some time ago by Prof. Scoville. Mr. Smith is a student of the Boston College of Pharmacy, who graduated this year. I was requested by Prof. Scoville to have the paper printed and read here. I replied that, as Chairman of the Section, I did not feel like expending any money for any one who was not a member of the Association; that I would gladly receive the manuscript and bring it up here, but I could offer little hopes that it would be read, which I think was proper. If Mr. Smith wanted it printed he should have sent in an application for membership. I did not receive any reply to this latter.

MR. CASPARI; I will say in connection with this matter that it has been the custom heretofore, when papers were presented by non-members, to admit them by special action. Of course a member has the right to present papers, but the papers of non-members are admitted by special vote, and they then become the property of the Association. I, therefore, move that, if Mr. Smith has not joined at this meeting, his paper be received and take the usual course.

The motion was seconded and prevailed.

MR. HELFMAN: Does that now go into the Proceedings?

MR. CASPARI: Yes, sir, it is now the property of the Association.

THE CHAIRMAN: This finishes the business of this Session, unless there is some special business to be brought up by any of the members. If not, a motion to adjourn will be in order.

On motion, duly seconded, the meeting adjourned.

SECOND SESSION, THURSDAY, AUGUST 26, 1896.

Chairman Alpers called the meeting to order at 10.30 a. m., immediately after the adjournment of the first session.

On motion, the reading of the minutes of the first session was dispensed with.

THE CHAIRMAN: The next business in order is the election of officers for the ensuing year.

MR. CASPARI: Can we not postpone that part of the business until the last session?

MR. BEAL: While I am satisfied that the entire Section could not make a better selection of officers than has been made, I am not sure but what it would be better, if it is permissible under the rules, to postpone the election of officers until the next session. I make this as a motion.

Mr. Good seconded the motion, and the same prevailed.

THE CHAIRMAN: The next order of business is the report of committees. As no reports have been presented, we can proceed to incidental business.

MR. CASPARI: There will be quite an important matter come up at the session to-night, but I do not see how we can handle it at this session, namely, the election of the two outgoing members of the Research Committee.

THE CHAIRMAN: The next in order will be the reading and discussion of papers.

MR. GOOD: There appear to be no authors of papers present to read them.

On motion, the Section adjourned to meet at 8 o'clock, p. m.

THIRD SESSION—THURSDAY, AUGUST 26, 1897.

The Third Session of the Scientific Section was called to order at 8 p. m. by the Chairman, Mr. W. C. Alpers, who said:

For the information of those who were not present at the First and Second Sessions of this Section this morning, I wish to state that, owing to the small number present, a great deal of business that should have been transacted at the First and Second Sessions was left over for the Third Session.

A temporary Secretary was elected, as our regular Secretary, Prof. Coblentz, is abroad. I am sorry to state that our temporary Secretary is also not here at this Session.

On motion of Mr. Mayo, duly seconded, Mr. Ryan was elected to act as Secretary *pro tem.*

THE CHAIRMAN: The first business this evening will be the reading of the minutes, but, as our Secretary is not present, we will have to dispense with that. A part of the business of this morning was the reading of the Chairman's Address, which was laid over until the Third Session, and will, therefore, form the first business to-night. I will request Prof. Good to take the chair.

Mr. Good having taken the chair, Mr. Alpers read his address as follows:

ANNUAL ADDRESS OF THE CHAIRMAN.

Gentlemen: During the last year, in conversation with pharmacists from all parts of the United States, I have not infrequently heard the remark: "Pharmacy has ceased to be a science; it is a mere trade, and a poor one at that."

Such remarks, so often repeated with emphasis and bitterness, will naturally make a deep impression on one who has always been an earnest advocate of the *profession* of pharmacy, as distinct from the *trade* of pharmacy; and it is not a mere mockery if to-day, in the opening address of the Scientific Section of the American Pharmaceutical Association, the question is put: "Is there Science in Pharmacy?"

Whosoever has looked behind the screens of our present pharmacies, and is familiar with the details of the pharmacist's daily toil, and whosoever has become the confidential friend of his brethren, to whom they unbosom themselves without reticence and disguise, knows that the commercial admixture to American pharmacy predominates over the scientific part to such an extent that the latter is nearly or entirely concealed.

Science in pharmacy is to-day, at best, like the princess in a fairy tale, lying spellbound under noxious weeds and thorns, awaiting her deliverance. And, knowing how pharmacy has to be practiced at present in order to afford a living, can we wonder at the prevailing state of affairs? Let us look at what *is*, and not deny the existence of evils because their recognition is disagreeable. How many truly pharmaceutical laboratories, con-

nected with the shop, are there to-day? How many pharmacists can vouch for the correctness of their preparations because they made them? If we ask a young graduate from any one of our pharmaceutical colleges whether he prepares his own potassium iodide or iron sulphate, he will probably consider us jokers; and yet there are old pharmacists, now living, who were taught to prepare their chemicals themselves, and who actually did so in their younger years.

Further than this—synthetic and isolation products have, in a large measure, in the physician's armamentarium, supplanted natural and galenic products; and, while theoretically most of these concentrated or artificial remedies could be prepared on a small scale, no pharmacist can soberly think of doing so; the costliness of the needed apparatus, the skill and mental quiet requisite for such work, the unavoidable loss of time and material by failures in experimenting,—and in many cases also, legal restrictions against the use of others' inventions—all these render the home-manufacture of most of the articles that are characteristic of the modern materia medica impracticable or impossible.

But, in recent years, the same ban has begun to fall even on the more easily made class, called galenical preparations. Extracts, oleo-resins and fluid-extracts are now but rarely made in the shops; tablets and pills are bought ready-made; tinctures, syrups and elixirs still linger, like favorite children, in the pharmacist's laboratory, but who knows how long? Look ahead but a half generation; and the same piteous smile, with which most of us regard the old fogy who talks of preparing his own iodides, will meet us when we advocate the home preparation of pills, tinctures and fluid extracts. The chemical factory has already absorbed the thousands of formerly extant small, chemical laboratories, and now produces goods in never-ending variety, superior, in many respects, to theirs, and at greatly reduced cost to the pharmacist, in most instances. And the time is fast approaching when the pharmo-chemical and pharmacal manufacturing industries, with their boundless array of capital and superior resources, will have rendered the pharmacist's modest laboratory, in every productive direction, not only superfluous, but, indeed, absurd.

Let us then recognize this fact without self-deception,—that the trend of pharmacy is decidedly toward the abolition of all productive home work. The majority of physicians —and the public in general—are willing to accept the products of large manufacturing firms as being at least equal in purity and strength to those that could or might be furnished by the pharmacists themselves. There is a decided demand for such manufactured or prepared goods, and there must be, and will be, a supply. Hundreds of pharmacists have for years quietly submitted to this state of affairs. They buy and sell, for instance, many gross of packages of pressed herbs, without ever having seen their contents, and, in many instances, without even any acquaintanceship with the appearance of the plant in its fresh state. They buy and dispense thousands of pills without verifying their composition,—often, indeed, without taking care to know their formula. They are apt to deprecate prescriptions calling for particular skill or deftness, as being tedious and unprofitable; and they usually take more interest in a new soda-water drink than in a new chemical compound. Driven by the unconscionable competition of department stores, and others, into a state of nervous agitation, often bordering on recklessness, it is no wonder if they sometimes come to ignore their professional standing, and plunge head over heels into the fierce strife for mere commercial supremacy. And, what is the worst sign of the times from the point of view of our initial question: "Is there Science in Pharmacy?"—is that the men who conduct their business on these lines are, as a rule, the most successful ones, if the gaining of wealth is to be the sole evidence of success.

These are undeniable facts, unpleasant because true, saddening because irrevocable. The abolition of the old-fashioned laboratory is the inevitable doom of old-time pharmacy. There is no prospect of a change, and all hope of a better conditior, to arise spontaneously out of this chaos, is based on self-deception. And, acknowledging these

facts, conscious of their truth, we find the question confronting us, with relentless pertinence: "*Is there Science in Pharmacy?*"

Before trying to find a consolatory answer thereto, let us cast a side-glance at our sister-profession—Medicine.

Pharmacists in general are quick to charge the causes of many of their sufferings to those who naturally ought to be their best friends—the physicians. Alas! the medical man answers us like a living echo, and thus the charges and countercharges fly back and forth between both professions, like ungovernable boomerangs.

Let us not forget that the physician, too, walks a stony road, and that the couch of roses on which many a pharmacist imagines him to rest is full of thorns. If the department store steals the pharmacist's customers, the free dispensary allures patients from the physician. Something must be done in both cases, to recover the loss. The pharmacist has his attractive store, with its variety of goods, and in reckless despair, adds low prices to many other temptations; the physician can find but one means of special attraction to his patients—the free dispensing of medicine. Both may herein be proceeding from fallacious premises, and thus their action, far from abolishing their ills, must, in its ultimate results, only increase them. But there is, at least in the beginning, a deceptive semblance of a turn for the better.

How easily can a young physician, traveling this seductive path, assuage his conscience! It may be true that he has no knowledge of pharmaceutical manipulation, nor may he know how to prepare extracts or tinctures. But what of that? The new synthetic remedies, the category in which he mainly trusts, come to him in tablet form; the dose is weighed or measured for him; the full indications and directions printed on the label. It is then so easy to denounce "polypharmacy," which demands a certain amount of skill in compounding; for, "only one remedy at a time," is the motto of modern medicine, and, such being the fact, what is the use of writing prescriptions and giving away valuable knowledge? Why not let the patient come back for more, and therewith let him pay another fee? There is, then, no opportunity for any one to criticise prescriptions, and, in case of a mistake, there is no trace of evidence, no document to serve as proof. Thus the physician, like his pharmaceutical brother, plunges into the commercial whirlpool and makes a maddening chase after all those patients who are liable to measure their physician's skill by the amount of free medicine he gives them. But enough of this contemplation, which might end by leading up to a parallel odious question: "*Is there Science in Medicine?*"

These cheerless pictures of the two professions must seem indeed discouraging to the lover of science and of professional work, especially when we compare therewith the present sources of education of the pharmacist and of the physician. There is no doubt that both medical and pharmaceutical colleges have enlarged their curricula during the last ten years. A higher professional status has been mapped out, and a higher initial standard has been made obligatory upon those who wish to enter as students. If, then, at the same time, the financial results, to both professions, have grown poorer, as shown before, doubts may well arise as to whether this business retrogression has taken place in consequence or in spite of the higher education now secured. Not seldom do we hear denunciations against our colleges, for having curtailed the profits of pharmacists. It is asserted that, because formerly greater prosperity reigned among us, it were not amiss to abolish the educational institutions and return to the former primitive conditions of our calling.

It is not necessary to refute such deductions. The root of the trouble obviously lies in quite a different direction. The numerous and wonderful inventions in all the domains of science and art, the countless applications of machinery to the needs of daily life, the total changes of aspect on almost every subject, and entirely new modes of living, have brought about new eras, not only in pharmacy and medicine, but in every profes-

sion and business;—to adhere obstinately to old conditions and usages must necessarily lead to the dire results before depicted;—let us, therefore, rather acknowledge that a new day has dawned; let us courageously break with our evanescing past; let us cast a discerning eye toward the unlooming future, and thereon adapt ourselves to new surroundings and study new methods!

The great advances made in analytical and microscopical work, and the discoveries of the medicinally active principles in organized nature, have demonstrated that a tincture, a fluid extract,—or any other galenical preparation,—is not perfect until assayed and standardized. A generation ago, we believed that all that was necessary to have perfect preparations was to secure the best drugs and use the most approved methods, and use due care in making preparations from them. To-day, we know how unreliable the untested result of even the most careful work of the most accomplished pharmacist must be; and our Pharmacopœia, in its latest edition, has recognized this fact, in some places, by directing methods of assay for three of the most potent tinctures.

There is no doubt that this principle of standardization will soon be extended to every pharmaceutical preparation, and every pharmacist will then be able, if he cares, to supply absolutely reliable preparations; but, in order to do so, he must become an adept in assaying and standardizing.

More than this,—microscopy and bacteriology have become indispensable aids to medical practitioners who have an open eye for the discoveries made in their science. We know now that the microscope will reveal the germs of many diseases in the various secretions of the human body; and we know that, with the aid of culture fluids and incubators, the origins of other diseases, which until recently were considered beyond etiologic determination, have been identified.

The use of the microscope is therefore a necessary aid to diagnosis; and the assistance of the bacteriological laboratory in disposing of diagnostic suspicions has passed beyond the stage of mere theory. It is impossible for the physician to charge himself with this work. The continuous turmoil in which he lives—rushing from patient to patient, the lack of rest, both physical and mental, the many thoughts that must weigh on his mind in the treatment of the various cases to which he is called daily,—all these are antagonistic to the quietude and concentration necessary for operating with the microscope, or for controlling the development of bacteria. Hence, the physician must look for an ally, who shall be well adapted to help him in his grave and complex task; and who should be better adapted therefor than the pharmacist? Here is a true field for desirable action, a field still largely unclaimed! But the few pioneers who have ventured into this new region report with enthusiasm on the immense scope of work and usefulness that they find before them.

It rests with us, the pharmacists of the United States, whether our pharmacies shall thus develop into harbors of advanced science or not; it rests with us to properly interpret "the handwriting on the wall;" it rests with us to act in time and prepare for the new era. That "new pharmacies" on this order will come into existence, and that a demand for them is already felt, cannot be doubted. If we sit idly by, others will cultivate this field, which now awaits the energetic pioneer, and we shall afterwards have ample leisure to complain that still another source of income and power has been wrested from our control.

The pharmacist of the future, although able to make all chemical and pharmaceutical preparations, will exercise this acquirement only in exceptional cases; his chief duty in this relation will be to assay and analyze whatever supplies are furnished him by the various manufacturers. While he will be in a position to compound any prescription that may be presented to him, he will principally busy himself with still higher and more recondite work. Physicians, before writing prescriptions, will, in many cases, instruct the patient to present himself to the analytical pharmacist, who will examine his blood or analyze

the secretions of his body. The report on this work will go to the physician, who will then, on the strength of such scientific assay, make or modify his diagnosis and prescribe accordingly.

A new learned art, a new written system of application of science, will thus develop.

The public will soon follow up this advanced course of practice. Instead of putting faith in quackery, they will take their milk, water, food and other articles to the analyst to learn of the hidden causes of their diseases. Thus the analyst-pharmacist will be the connecting link between the laity and the medical profession, indispensable to both, a constant searcher for the truth, a once more truly professional man. And, finding proper recognition for his new work, he will at the same time become a discoverer and pioneer of new methods of research and assay. The vastness of the task to which his life will then be devoted is almost confusing, even to our present sight; and, with the perennial progress of science, it will soon become impossible for any one man to master all the different branches and divisions of this analytic art. Specialists will develop, according to each one's inclination. One will, perhaps, make the examination of food-stuffs his particular work; another will embrace bacteriology as his favorite branch; microscopy will be the life-study of a third; and the search for, and determination of, toxic chemicals will occupy a fourth.

From such sources will emanate contributions to scientific literature; their reports will find eager attention all over the world; and an ennobling emulation will spur the authors on to distinguished efforts. The existence of such assaying pharmacists will also exert a beneficial reflex influence on the colleges. It will become the pride of schools of pharmacy to see at least some of their graduates engage in such work every year. Higher preliminary requirements, among them the study of foreign languages and certain additional branches of mathematics, will become compulsory; and teachers of broader knowledge and capacity will be in demand.

Thus, instead of being places of wearisome routine and drudgery, these institutions will become the abode of active and progressive minds; and, far from priding themselves on successful competition with the "general store" in the favor of the sidewalk public and "shoppers," our pharmacies will once more resume their proper place in the general estimation of society, as homesteads of a specially respected, highly responsible, confidentially trusted "learned profession." Nor will their emoluments be likely to fall at all behind due proportions to the influence and social rank of their functions.

And still we need not fear that too many will at once rush into this new field and overcrowd it. The same demands of a purely commercial nature will then, as now, be made by the public on pharmacists and drug stores, as they now exist, with their variety of supplies for the boudoir, the nursery, and the sick room; while their attractions for the palate, the nostrils and the eye, will remain a necessity of common usage in every civilized community. Those of us whose inclinations point to a commercial form of occupation will gladly and successfully supply this demand. Licentiates of mere "pharmacy," as now understood, will likewise continue to exist, and to be added to by new graduates each year, and their field of action and of competition will be as broad as it is now. Thus *two classes* of pharmacists will come to exist, not hostile to each other, but mutual co-adjutors in their respective lines of work, and supplementing one another. The commercial pharmacist will refer difficult and intricate problems to his assaying brother, the assayist will call on the other for goods and supplies. But all can meet on common ground in the American Pharmaceutical Association. As if this future state had been foreseen by our Association, different Sections have already been established in it. We have the Scientific Section to represent the one chief direction of effort, the Commercial Section for the other, while the Legislative Section may be looked upon as a link between both.

The assayist, as here depicted, must of necessity be a man of higher education and

broader knowledge than our present graduate in pharmacy. He should have received a preliminary education of academic grade, and should have then specially prepared himself for his difficult and responsible mission by following the best collegiate courses in the country. An error, if made in his work, is apt to be of far more serious consequences than an error made by a prescriptionist, for it may not only endanger one patient's life, but become a calamity to a whole commuity. Let us suppose that an epidemic of typhoid fever rages in a locality. Water from a suspected well is taken to an analyst, who, through ignorance or carelessness, may declare it to be free from typhoid germs, while in reality it is badly infected. The public, confiding in his report, would continue to use this water, and immeasurable suffering and misery would be entailed upon a number of families.

If, then, work of this kind can have most beneficial results when properly done, and most pernicious results when performed by an incompetent agent, the public safety, as a matter of course, demands that proper restrictions be laid on its existence and that nobody be entrusted with it without having given absolute evidence of his fitness. Such restrictions should be rigidly conceived and enforced, and severe penalty must be imposed on him who assumes the responsibility of such work without possessing the prescribed qualification.

It behooves the American Pharmaceutical Association to assume leadership in such a new departure; and I would, therefore, urge this Scientific Section to take whatever it may deem the proper initiatory step thereto.

To refer such serious and far-reaching reforms to the fickle legislatures of our various states, appears futile or dangerous; for the endless confusion that now surrounds our manifold pharmacy laws would but be augmented. The best course, therefore, in my estimation, would be to attempt making it a *National Issue*. If the Constitution of the United States should not admit of direct national legislation of this kind, we may still, perhaps, reach a satisfactory result through the executive branch of our government, supported, of course, by Congress in the way of appropriation of funds for the purpose. The creation of a *department of health*, either as a division of an existing department, or, better still, as an independent department, would probably solve the question. Let "Officers of Health," with proper equipment, be appointed in the various federal administrative districts of our own country, with sub-stations to be created in cities and towns, according to the number of inhabitants and other pertinent conditions. Let the officers of this branch of the service be such only as are educated in pharmacy and all the allied sciences; and let them, after passing the requisite examinations, receive their credentials from the central authority. Civil service reform has passed beyond the line of mere experimentation; and if its rules are strictly applied to this new department, it can be kept free from all political influences and their demoralizing effects. Admitting that such sanitary licentiates or officers—whatever they may be called—will have no authority in state matters, their positions will be so exalted and independent, their influence so powerful, and their functions so beneficial to the general welfare, that the enactment of state laws in accordance with, or as supplements to, the national administrative measures will thereby be gradually prompted, in such form that state licenses for similar functions shall be granted to those only who have passed the United States government examination.

Neither time nor place allow me to enter now into any of the presumably desirable details of such a plan, but I trust these few words may find a harmonious echo in the minds of the members of the Scientific Section. Nor can I claim to be the first one to look forward to a National Department of Public Health as the relief from the many disadvantages and drawbacks caused in Medicine and Pharmacy by the confusing multitude of state laws. Only recently the American Medico-Surgical Bulletin, in an able editorial, arguing from the standpoint of the medical man, made the same demand, and U. S. Senator Mallory, from Florida, has already introduced a bill in the Senate for the establishment of such a department.

I, therefore, recommend that a committee be appointed, either by this Section or by the Association, to whom this matter should then first be referred, to examine the bill introduced by Senator Mallory, and to confer with its author, for the purpose of procuring for Pharmacy and its subsidiary sciences proper recognition and representation in the proposed National Department of Public Health; or, if this bill should fail, to take proper steps for the introduction of a new bill (Applause.)

MR. PRESCOTT: I move that the address be received and referred to the Committee on Publication, with the thanks of the Association.

Motion seconded by Mr. Feil.

MR. PRESCOTT: It may be thought desirable to refer this to a committee with reference to the recommendations contained in it, and if it meets with the judgment of the members I will change my motion, with the consent of the second, to that form.

Motion as amended was seconded and prevailed.

MR. HALLBERG: Mr. Chairman, if I am in order, I move that the recommendation containing the chairman's address be referred to the Section on Education and Legislation.

Motion was seconded by Mr. Ebert and prevailed.

Mr. Alpers here resumed the chair and announced that next in order would be the reading of papers, and called on Prof. Prescott, who read the following in abstract:

THE CAFFEIN COMPOUND IN KOLA.

PART. II. KOLATANNIN.

BY JAMES W. T. KNOX * AND ALBERT B. PRESCOTT.

The investigation of the caffein compound in kola conducted by us last year† showed us that it was a kolatannate of caffein instead of a glucosid as formerly supposed. This question then arose: Is the tannin of this body identical with the free tannin existing in the kola nut? In the very brief examination made at that time it seemed that there was some difference, for combustións of both kinds of the tannin showed a difference in the respective amounts of carbon and hydrogen of each. No interpretation of the results was made at that time, for we considered the data insufficient, and the question was not settled.

It became necessary, in order that this point might be positively determined, to make a thorough comparative study of these two forms of kolatannin, and the research has been continued along this line with results which are stated in the following pages.

Classification of Tannins.

Several different means of classifying tannins have been proposed, such as "physiological" and "pathological"—referring, of course, to their ori-

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* Holder of the Stearns Fellowship in the University of Michigan.

† Knox and Prescott, 1896: Proc. Am. Pharm. Assoc., 44, p. 136.

gin in the plant; glucosidal and non-glucosidal; "iron-blueing" and "iron-greening;" tannins which are tanning agents and those which are not; those which yield a tri-hydroxy-phenol by sublimation or by fusion with potassium hydroxid, and those which yield a dihydroxy-phenol by sublimation, or the salt of a dihydroxy benzoic acid by gentle fusion with potassium hydroxid.*

Trimble † suggests a classification, not as a final one but which answers very well for the present, in view of the still very defective knowledge of this class of bodies. He proposes a division of them into "the gall tannin group" and "the oak tannin group." The tannins of the gall tannin group contain 50–52.5 per cent. of carbon and 3.10–4.50 per cent. of hydrogen; those of the oak tannin group contain, in round numbers, 60.00 per cent. carbon and 5.00 per cent. hydrogen. This classification holds good for the following reactions also:

	Gall Tannin Group.	*Oak Tannin Group.*
Ferric salts.	Blue color and precipitate.	Green color and precipitate.
Calcium hydroxid.	White precipitate becoming blue.	Light pink precipitate becoming red and then brown.
Bromin water.	No precipitate.	Yellow precipitate becoming brown.

Under this classification kolatannin is to be compared with the oak tannin group, for its compositions and reactions coincide more nearly with those of oak tannin than with those of gallotannic acid. We include herewith a brief summary of some important work done on oak bark tannins, not only for its historic interest, but because it has a bearing indirectly upon our own work on kolatannin.

Recent Literature of Oak Bark Tannins.

In February, 1880, Böttinger‡ published a lengthy article on "oak red," phlobaphene and tannin, which was followed about a month later by Etti's§ publication of his own work on oak tannin—a valuable contribution to its literature. The methods used by them in the preparation of their working samples differed radically, the botanical source of their barks or extracts was unknown to them (or, if known, was not stated), the tannins obtained possessed properties different from each other, and it is not strange that the results obtained by these investigators were at variance in many particulars. If we may judge by their descriptions, it would seem that Etti's method of separation was much more likely to yield a pure product than that used by Böttinger, although by no means free from objections.

* Prescott: Organic Analysis, p. 466.

† Trimble: The Tannins, II, p. 131.

‡ C. Böttinger, 1880: Annalen, 202, p. 269.

§ C. Etti, 1880: Monatsh. f. Chem., I, p. 262.

Without doubt this work of Etti and that of Löwe* dated in September of the same year, but which did not appear until the following year, added more to the knowledge of oak tannins than any previous contributions had done. The methods used by them are noteworthy, because they were radical departures from the old lead acetate methods formerly so much in vogue.

Etti extracted the oak bark with very dilute alcohol under gentle heat and added acetic ether and ordinary ether to the extract. After agitating, the faintly red-colored ethereal layer was separated, the ether recovered by distillation and used again for the same purpose. After distilling the ether, the alcoholic solution of tannin remaining behind was found to contain some crystals of ellagic acid, which were removed by filtration and the filtrate evaporated to dryness on a water bath. The residue, a reddish-white powder, was oak tannin, mixed with a little phlobaphene, amorphous resin and gallic acid; the two last-named substances were separated by extracting the powder with non-alcoholic ether; it was next treated with a mixture of three parts acetic ether and one part ethyl ether, which removed the tannin and left the phlobaphene undissolved. After distilling off the solvent, the pure tannin remained behind as a reddish-white powder. Etti insists, too that if the ethyl acetate be used again for a solvent it must be washed with sodium hydroxid solution and redistilled before use. as the tannin tends to decompose it slightly into acetic acid and alcohol, while the tannin is itself partially converted into its anhydrid.

The method of Böttinger depends on the separation of the phlobaphene from tannin solutions by means of its comparative insolubility in water. The tanbark is extracted first with ether, then with alcohol, the alcohol solution is evaporated to dryness, and the residue extracted again with ether which removes the last traces of wax and fat. By warming the residue with water on a water bath, a partial separation is effected of the insoluble phlobaphene from the soluble tannin. After filtration the tannin solution, still containing traces of phlobaphene, is repeatedly evaporated and redissolved, until upon diluting the liquid very largely and cooling it, no precipitation is had. On evaporating this solution, a light colored residue is obtained which is soluble in water and which he considered the pure tannin.

Löwe extracted the oak bark with 90 per cent. alcohol, and distilled the extract in vacuo to syrupy consistency. Water was then added, which precipitated a large quantity of anhydrids: after filtration common salt was added to saturation, which precipitated the remaining anhydrids completely; the liquid, after filtration, was agitated with ether repeatedly until this solvent would remove nothing further from the solution. The remaining ether was dissipated by gentle heat and after cooling the solution was

* J. Löwe, 1881: Zeitsch. f. anal. Chem., 20, p. 208.

shaken out with acetic ether. The acetic ether was removed by distillation and cold water was added to the remaining residue as long as precipitation ensued, after which it was again filtered and evaporated slowly in a vacuum desiccator to a dry mass, which is soluble in water and becomes cinnamon-brown on being pulverized.

It will be noticed that the methods of Etti and Löwe have much in common, the principal difference from the other methods being in the use of ethyl acetate, an immiscible solvent. It is difficult to say to whom credit should be given for the first application of this solvent to the preparation of tannin. In 1873,* however, Löwe mentions having used it in his work on sumach tannin, while in 1872 † he also made use of it as a separative solvent for gallotannic acid.

Etti ascribed the formula $C_{17}H_{16}O_9$ to his tannin: a "first anhydrid" $C_{34}H_{30}O_{17}$ was formed by heating the tannin at 140° C. He separated a ready-formed anhydrid from the bark corresponding to this one, and made use of its barium salt $C_{34}H_{28}BaO_{17}$ to determine its formula. By boiling it with dilute hydrochloric or sulfuric acid, it loses another molecule of water, forming a second anhydrid, $C_{34}H_{28}O_{16}$. The third anhydrid he prepared by boiling the pure tannin with dilute mineral acid, whereby two molecules of tannin lost three molecules of water, forming a body to which he ascribed the formula $C_{33}H_{26}O_{15}$. This anhydrid corresponds, in Etti's opinion, to Oser's oak red. Boiling the pure tannin with potassium hydroxid solution for some time, formed the first anhydrid, identical with the so-called oak bark phlobaphene; this was separated by acidulating the alkaline solution with mineral acid and filtering out the precipitated anhydrid.

By various experiments, such as boiling the tannin with dilute acids, digesting it with ferments, etc., he arrived at the conclusion that oak tannin was not a glucosid, but that such evidence of glucose as had been found by other investigators was due to the accidental presence of glucose in the sample.

He proposed a structural formula, the same as that of digallic acid with three hydroxyl groups replaced by three methyl groups, he having detected methyl chlorid by burning the gas formed by heating the tannin with concentrated hydrochloric acid in a sealed tube.

Böttinger's work was principally on oak phlobaphene and oak red, which he considered identical. The oak red was formed by boiling the tannin with dilute mineral acid. He ascribed the formula $(C_{14}H_{10}O_6)_2.H_2O$ to it and believed oak tannin to be a glucosid.

Löwe proposed the formula $C_{28}H_{28}O_{14}$ for the tannin he prepared and $C_{28}H_{22}Pb_3O_{14}$ for the lead salt. He also prepared oak red by the usual pro-

* J. Löwe, 1873: Zeitsch. f. anal. Chem. 12, p. 128.

† J. Löwe, 1872: Zeitsch. f. anal. Chem. 11, p. 365.

cess of boiling the tannin with dilute acids and obtained in addition to the oak red, $C_{28}H_{22}O_{11}$, a by-product of which he made a combustion, but did not identify. It was not sugar, however, and he states that oak tannin does not conduct itself as a glucosid. The oak phlobaphene is, according to his statements, a fourth anhydrid of oak tannin of the formula $C_{28}H_{24}O_{12}$, and forms a lead salt $C_{28}H_{22}O_{12}Pb$.

A somewhat extended and not altogether good-natured controversy between Böttinger and Etti followed the publication of the latter's paper, Böttinger* insisting upon the correctness of his own work, and holding to his first statement that oak tannin was a glucosid. Etti,† on the other hand, contended that Böttinger's methods were faulty, that ready formed glucose would not be separated from the tannin by Böttinger's process, and therefore sugar would of course be found in the solution after boiling the tannin with dilute acids. He performed a number of experiments tending to prove the correctness of his position, following Böttinger's methods also and criticising him severely. Böttinger ‡ subsequently modified his position somewhat, but without conceding anything of importance.

In 1883 the next contribution appeared, in which Etti § again commented on Böttinger's work and quoted Löwe in confirmation of his own results. He reported a new tannin, of formula $C_{20}H_{20}O_9$, from *Quercus Pubescens*, while the other he had since learned was from *Quercus Robur*. This new tannin colored solutions of ferric salts green, while the first one produced a blue color with them. During this investigation the objection already noted to the use of ethyl acetate, viz., its tendency to decompose the tannin, became so marked as to necessitate a different method of separation. The most important points of this new method are the use of alcoholic ether as a solvent for the tannin, phlobaphene and green resin. The resin is removed from the resulting product by benzene, and the phlobaphene by careful addition of lead acetate to the tannin solution. The precipitate of lead tannate is yellow, but if any anhydrid (phlobaphene) be present, the precipitate will be colored more or less reddish-brown, depending on the proportion of it to the tannin. Lead acetate is added until the color of the precipitate indicates that all of the anhydrid has been precipitated. After filtering, the liquid is again exhausted with alcoholic ether, the ether removed by distillation and the residual liquid evaporated to dryness on the water bath. A rather remarkable peculiarity of Etti's work is that both of these tannins are nearly insoluble in water—.6 of tannin in 100 of water—while the experience of other workers has been quite generally that tannins are soluble.

Etti claimed to have formed four anhydrids of this tannin, $C_{20}H_{20}O_9$.

* C. Böttinger, 1881: Berichte, 14, p. 1598.
† C. Etti, 1881: Berichte, 14, p. 1826.
‡ C. Böttinger, 1881: Berichte, 14, p. 2390.
§ C. Etti, 1883: Monatshefte. 4, p. 512.

First anhydrid,	$C_{40}H_{38}O_{17}$.	Oak phlobaphene, dried at 120°.
Second "	$C_{40}H_{36}O_{16}$.	By boiling phlobaphene with 1 : 12 sulfuric acid and washing precipitate first with water, then with alcohol, and evaporating the alcoholic solution.
Third "	$C_{40}H_{34}O_{15}$.	Dried at 125°. By boiling tannin with dilute sulfuric acid and collecting the precipitate.
Fourth "	$C_{40}H_{32}O_{14}$.	By heating in 25 per cent. sulfuric acid containing 20 per cent. alcohol in sealed tube at 130° for four hours.

Etti believed also that four anhydrids were formed from the other tannin ($C_{17}H_{16}O_9$) and gave this view support by his own figures and some also of Oser, of Böttinger, and of Löwe. This would be apt to mislead the casual reader into attaching more importance to this theory of the four anhydrids, than is warranted by the actual results given by Etti. It would hardly seem that he was justified in making this use of the work of the other investigators. As a matter of fact he has selected figures here and there which gave support to his views, but ignored others of equal importance which did not harmonize with his ideas; e. g. he quoted Löwe's figures for the analysis of oak red, but did not mention his work with the lead salts of oak red, which brought him to the conclusion that the formula of oak red was $C_{28}H_{22}O_{11}$. There is no apparent reason for doubting that this work was equally as reliable as that which Etti quoted, and to omit it gives a careful reader the impression that deductions made from such peculiarly isolated facts would not necessarily be of great value. The chart is here appended:

		Calculated.	Found.			
Tannin, $C_{17}H_{16}O_9$	Carbon	56.04		56.31	56.06	
	Hydrogen	4.40		4.63	4.69	
First Anhydrid "Phlobaphene," $C_{34}H_{30}O_{17}$ Grabowski's oak red.	Carbon	57.46		57.28	57.62	
	Hydrogen	4.22		4.64	4.33	
Second Anhydrid $C_{34}H_{28}O_{16}$	Carbon	58.96		58.76		
	Hydrogen	4.04		4.20		
			By Oser.	By Böttinger.		By Etti.
Third Anyhyrid $C_{34}H_{26}O_{15}$ Oser's oak red	Carbon	60.58	60.70	60.19	60.08	60.33
	Hydrogen	3.86	4.03	4.22	3.94	4.03
			Found by Löwe.			
Fourth Anhydrid $C_{34}H_{24}O_{14}$ Löwe's oak red	Carbon	62.20	62.339	62.197	61.997	
	Hydrogen	3.66	4.154	4.015	4.056	

Böttinger* published in the same year, 1883, a piece of work done on

* C. Böttinger, 1883: Berichte, 16, p. 2710.

the bromin derivatives of oak tannin. By direct addition of bromin to the watery extract of oak bark he formed a dibrom oak tannin, $C_{19}H_{14}Br_2O_{10}$, which was capable of forming a pentacetyl derivative. "By careful manipulation"—he does not describe it—he converted the dibrom into a tetrabrom-tannin, which also formed a pentacetyl compound. This seems to be the first work on bromin derivatives.

In 1884* he investigated hemlock tannins by means of their bromin-compounds precipitated directly from their infusions by addition of bromin. Later† in the same year he prepared bromin compounds of a number of bark tannins by adding bromin directly to their infusions. Acetyl compounds of these were formed and analyzed.

Etti,‡ in a brief paper shortly afterward, discussed the points of difference between gallotannic acid and oak tannin. He also pointed out that by reason of its very hygroscopicity acetic anhydrid was not a proper agent for determining the number of hydroxyl groups of tannins, as its tendency would be to form anhydrids which in turn would be acetylized and lead to incongruous results in the analysis.

Böttinger,§ in 1887, published an article principally on oak wood tannin, which he separated by dissolving commercial oakwood extract in twenty parts of water and allowing it to stand. The clear liquid was evaporated to dryness and boiled with acetic anhydrid, which formed an acetyl compound whose composition corresponded to formula $C_{15}H_7(C_2H_3O)_5O_9$. From this he recovered an anyhdrid of oakwood tannin and formed mono- and tetra-brom derivatives of it.

In 1889, Etti,‖ adhering to his previously published formulas for oak tannins, gave the results of an investigation of a tannin from the common Slavonian oak, to which he gave the formula $C_{16}H_{14}O_9$. It was nearly or quite insoluble in water. He formed several soluble magnesium salts with this tannin and suggested that it might exist in the plant in this form, thus accounting for its solubility in an aqueous menstruum when first extracted. Several anhydrids were formed.

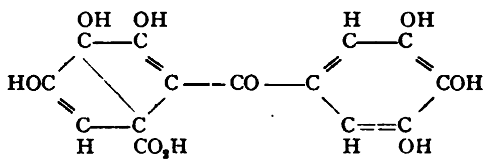
Any *résumé* of the literature of oak tannins, however brief, would be incomplete without reference to the work of Trimble.¶ His monograph in two volumes contains a praiseworthy compilation of previous literature on the subject and full accounts of his own work. He has the credit of introducing acetone as an extractive menstruum for the oak tannins instead of alcohol. This solvent is said to act particularly well with oak bark. A good bibliography concludes the work. He has confined him-

* C. Böttinger, 1884: Berichte, 17, p. 1041.
† C. Böttinger, 1884: Berichte, 17, p. 1123.
‡ C. Etti, 1884: Berichte, 17, p. 1820.
§ C. Böttinger, 1887: Annalen, 238, p. 366.
‖ C. Etti, 1889: Monatshefte, 10, p. 547.
¶ H. Trimble, 1894: "The Tannins." A monograph, J. B. Lippincott Co.

self thus far to analyses of the pure tannins and does not as yet propose formulas. In addition to the monograph just mentioned, he has been a frequent contributor on this subject in the periodical literature of chemistry.

Late Work of Schiff on Digallic Acid.

In the present year, Hugo Schiff (Gazetta, 1897, 27, i, 90), having already found that natural tannic acid is possessed of a slight optical activity, namely dextrorotatory, inquires as to its containing in some way a symmetric carbon, and infers a ketonic structure with six hydroxyl groups. He does not obtain a hydrazone from tannic acid. From experimental results he proposes this formula:



Irrespective of orientation, and for comparison of a kolatannin formula offered for consideration further on, the above formula may be held simply as

$$\left.\begin{array}{l} C_6H(OH)_3(CO_2H) \\ C_6H_2(OH)_3 \end{array}\right> CO$$

Caffeotannic and Caffeic Acids.

The literature of caffeotannic acid, of the formula $C_{15}H_{18}O_8$, dates from Rochleder, in 1846.* Its production of caffeic acid (dihydroxy phenyl acrylic acid), along with sugar, was set forth by Hlasiwetz in 1867.†

A few years ago, caffeic acid was obtained from the tannin of coffee, also from the tannin of the maté, by H. Kunz-Krause.‡ Very recently the same author has investigated caffeotannic acid.§ In his report|| he finds confirmation of the composition of caffeic acid as a dihydroxy phenyl acrylic acid. His analyses obtain the carbon dioxid given off when the caffeic acid is heated to 200° C., and are confined to this analytic method. A residue of a vinyl pyrocatechol is predicated. The author recognizes a class of bodies which he terms glucotannoids.

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* Ann. Chem. (Liebig), 59, p. 300.

† Ann. Chem. (Liebig), 142, p. 220.

‡ Arch. Pharm., 1893, 231, p. 613.

§ I am indebted to Prof. Kremers for bringing Kunz-Krause's article in the July Berichte to my attention, as I read this paper in the August meeting of American Pharmaceutical Association.—A. B. P.

|| Berichte, 1897, p. 1617.

"FREE" KOLATANNIN.

Preparation of the Sample.

The amorphous character of tannins, together with their extreme liability to decomposition, renders their separation and purification very difficult. The method used by us last year,* in the very brief examination of kolatannin, was based on that of Allen,† being fractional precipitation with lead acetate.

On taking up the work this year, it soon became evident that whatever may be said of lead acetate methods as applied to other tannins, they certainly are unsuited to this one, for various reasons. The lead kolatannate, being bulky, is extremely slow and difficult of filtration, and the tannin in this state exhibits a marked tendency to pass into insoluble forms, principally anhydrids. During the washing, the lead salt becomes gradually darker, and this tendency is favored by the moisture present. If, on the other hand, the washing be less prolonged, the resulting product will be contaminated with various other constituents of kola extract, such as sugar, alkaloids, inorganic salts, coloring matter, etc., etc. It is indeed very doubtful if any usual amount of washing will remove these impurities, hence the purity of a tannin separated by precipitation with lead acetate would be regarded with too much suspicion to be employed in analytical work, even if its sensible properties were not changed during the treatment. Kolatannin was at first supposed and since determined to be soluble in water. But on evaporating the solution of tannin after removing the lead from combination by hydrogen sulfid, the end product was a red brown substance, insoluble in water, and possessing a not particularly astringent taste. So by the use of lead acetate a tannin is obtained whose purity is a matter of doubt, and whose properties have undergone radical changes during separation, both as to color and solubility. Furthermore we desired to effect a perfect separation of the free tannin from that existing in combination with caffein (as caffein kolatannate) in order to determine by analysis whether they were identical tannins or not, the analysis of them last year having shown somewhat different values in each for carbon and hydrogen. Caffein kolatannate is sparingly soluble in water, more soluble in solutions of tannin and of caffein, so that the aqueous infusion of kola contains caffein kolatannate as well as free tannin, and the lead tannate obtained from it would be a mixture of the lead salts of both tannins, or both forms of tannin, and no delicate separation could be had in this way.

Plainly another method was necessary. The objections just noted were for the most part neither new, nor limited to kolatannin. As previously stated, Löwe, in 1872, who had encountered many difficulties in the use of lead acetate for the separation of tannins, and found it necessary to employ other means to obtain a pure product, resorted to the use of ethyl

* Knox and Prescott, loc. cit. † Allen: Com. Org. Anal. III, pt. I., p. 76.

acetate. This immiscible solvent proving satisfactory in many cases has since been used considerably, either alone or mixed with ether, in the separation of tannins for analytical purposes, and for some tannins at any rate is unquestionably the best separative solvent which has yet been given publicity as such. At the same time a single shaking out with ethyl acetate does not suffice for the preparation of a pure sample. More or less coloring matter will be found in the residue left on evaporating the first portion of the solvent, so that several repetitions of the process are required. Care must be used not to carry the method of purification too far, for if this be done the decomposition of the tannin is apt to prove a greater obstacle than the original impurities. We find that four or five repetitions of the "shaking out" give the best results. In detail the manipulations are as follows, and the method has given satisfactory results:

The fresh kola nuts are sliced into boiling alcohol,* removed after a few moments boiling, and dried in a current of warm air, then ground up to a number twenty powder and packed firmly in a percolator. The alcohol so used in sterilizing the drug is diluted to about fifty per cent. strength, and employed as a menstruum, with addition of sufficient dilute alcohol to complete the extraction. The highly colored extract of kola thus obtained is concentrated by distillation in vacuo, until the alcohol is all removed. This can be done with a good pump at between 18° and 20° C. The contents of the flask are then filtered, the insoluble portion being chiefly caffein kolatannate, while the solution contains caffein, kolatannin, caffein kolatannate, glucose, traces of fatty matter, and more or less colored derivatives of tannin according to whether the sterilization by boiling alcohol has been properly done. Common salt is then added to this filtrate to saturation and the caffein kolatannate is completely precipitated. It is filtered out and added to the first residue of caffein kolatannate. The reddish colored filtrate is then transferred to a large separatory funnel and agitated with chloroform repeatedly to remove alkaloids and traces of fat. The dissolved chloroform is then separated by agitation with small portions of ether. Kolatannin is insoluble in chloroform, and only very sparingly soluble in ether, so this treatment does not remove any considerable amount of it. Ethyl acetate is now added to the liquid in the separatory funnel and the liquid extracted with it as long as any tannin is removed. Usually eight, ten or even more successive portions are required for this. The united solutions of tannin in ethyl acetate are transferred to a distilling flask and concentrated to dryness under reduced pressure. To avoid loss of the ethyl acetate we use a condenser about a metre in length, and pack the receiver in ice. Sometimes also a condenser is placed between the pump and the receiver. With these precautions the waste is very slight. Before using the recovered ethyl acetate as a solvent again, however, it is washed with a weak solution of sodium carbonate and redistilled, to avoid

* To prevent the formation of the colored body, which would otherwise appear.

the presence of any free acetic acid formed by decomposition of the ether. The statement of Etti already alluded to, concerning the decomposition of ethyl acetate by tannin, has not been found to apply to kolatannin, but the washing was nevertheless adopted as a precautionary measure.

The tannin residue in the distilling flask is a porous, pinkish mass, very friable, and easily and completely soluble in water. It is redissolved in a convenient quantity of saturated salt solution, filtered if need be and again shaken out with ethyl acetate, which is distilled off in the way just described. The tannin residue is next dissolved in cold distilled water and shaken out as before, this process being repeated once or twice. The final tannin residue, after the ethyl acetate has been removed as far as possible by distillation, is treated in the flask with a small quantity of ether, which after thoroughly permeating the mass is removed by distillation, using only the partial force of the pump and gentle heat. This is repeated several times until the mass has no odor of ethyl acetate. Then transferring to a vacuum desiccator the tannin is kept for several days over sulfuric acid. If this does not remove the last traces of ether, gentle heat (60°–65°) will do so.*

Properties of Kolatannin.

Kolatannin is a cream-colored powder with a slight pinkish tinge. It is freely and completely soluble in water, alcohol, acetone, ethyl acetate, sparingly soluble in ether, insoluble in chloroform and in benzin. The following tabulated comparative statement of its reactions will serve to point out some of the important differences between it and gallotannic acid, and to indicate the close resemblance between this tannin and that of oak bark.

Reactions of Tannins.

	Kolatannin. Free.	Kolatannin. From caffein kolatannate.	Oak Tannin. (Trimble.)	Gallotannic Acid.
Ferric acetate	Green.	Green.	Green.	Blue-black.
Potassium dichromate	Dark brown ppt.	Dark brown ppt.	Brown ppt.	Brown ppt.
Chlorin	Pale ppt.	Pale ppt.		
Bromin	Light yellow ppt.	Light yellow ppt.	Yellow ppt.	No ppt.
Calcium hydroxid	Pink, then red, changing to ppt.	Pink, then red, changing to ppt.	Red, changing to ppt.	Darkens with bluish tinge, then ppt.
"Tartar Emetic"	No ppt.	No ppt.	White ppt.	White ppt.
Quinin, Cinchonin, Caffein	White ppt.	White ppt.	Ppt.	White ppt.
Albumen	Ppt.	Ppt.	Ppt.	Ppt.
Lead acetate	White ppt.	White ppt.	White ppt.	White ppt.
Ammoniacal potassium ferricyanide	Deep red.	Deep red.	....	Deep red.
Solution of formaldehyde with a condensing agent, as HCl	Pink ppt., becoming red.	Pink ppt., becoming red.		

* We desire to take this means of expressing our appreciation of the liberality and courtesy of the firm of Frederick Stearns & Company, Manufacturing Pharmacists, Detroit, Michigan, who supplied us with a large quantity of True African Kola nuts, for our research this year. The drug was quite fresh and in perfect preservation, very necessary conditions for work of this kind.

Combustions of Kolatannin.

The tannin was analyzed by combustion with the following stated results:

	I.	II.	III.	Calculated for $C_{16}H_{20}O_8$.
Carbon	56.74	56.81	56.90	56.45
Hydrogen	5.71	5.62	5.76	5.90
Oxygen	37.55	37.57	37.34	37.65
	100.00	100.00	100.00	100.00

Having this satisfactory evidence of the preparation of a pure chemical compound, we next proceeded upon the task of determining its constitution, first by finding the number of hydroxyl groups in the molecule containing C_{16}.

Pentacetyl Kolatannin.

An acetyl derivative was next formed for the object above stated. The tannin was boiled with acetyl chlorid for about one hour under a return condenser, then an equal volume of glacial acetic acid was added, after which the liquid was poured slowly into ice-cold water. The acetyl compound separated out as a voluminous whitish precipitate. This was rapidly filtered at the pump and well washed with cold water, then it was dried with bibulous paper and finally in a vacuum desiccator over sulfuric acid. It was a nearly white or gray-white powder, tasteless, having a faint odor of acetic acid, and was insoluble in water, sparingly soluble in ether, and freely and completely soluble in chloroform, in alcohol, and in glacial acetic acid.

Analysis of the body gave the following stated results:

	Found.			Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{15}$-$(C_2H_3O)_5O_8$.
Carbon	56.55	56.68	56.76	56.72
Hydrogen	5.39	5.36	5.24	5.47
Oxygen	38.06	37.96	38.00	37.81
By saponification.				
Acetyl	38.24	38.47	38.68	39.09

On comparing the values given by analysis with those calculated for the pentacetyl derivative, the agreement seems to be satisfactory.

The acetyl values in the analysis by saponification as detailed below are a little low, but it is quite possible that this is to be ascribed to defects in the method of estimation rather than to other causes. At any rate the acetyl content seems without doubt to indicate five hydroxyl groups in the C_{16} molecule rather than four or six.

The analyses by combustion were made in the ordinary way: the estimation of acetyl was conducted in the manner next described.

Determination of Acetyl.

The acetyl compound, 0.500 to 1.000 gm., varying with the supposed acetyl content, is boiled with thirty to forty Cc. of six per cent. sulfuric acid in a flask fitted with reflux condenser, for two hours. One hundred to one hundred and fifty Cc. water are now added and without filtration the volatile contents of the flask distilled into a known quantity of decinormal potassium hydroxid solution, being careful to avoid a high enough temperature or sufficient concentration to cause distillation of the sulfuric acid. More water is now added to the distilling flask and the distillation repeated. The contents of the receiver should be kept alkaline and a few drops of phenol-phthalein solution added, so that any change in the reaction of the solution may be instantly noted. The distillation should be repeated several times until the last one hundred Cc. of distillate contains no acetic acid. The excess of alkali is to be titrated with decinormal hydrochloric acid, and the amount of acetic acid calculated from the difference between the amount of alkali solution first taken, and the quantity of hydrochloric acid required to neutralize it. Barium chlorid is now added, and if any precipitation takes place, the barium sulfate is collected and weighed, the sulfuric acid calculated and correction made for it. If a halogen be present in the acetyl compound a sufficient excess of silver sulfate is added to the contents of the distilling flask before distillation, to precipitate it completely as silver salt.

The above was occasionally deviated from by heating the acetyl compound with the dilute acid in sealed tubes two or three hours at 130°, then cooling, opening, transferring to a flask and distilling as before described.

The following described method was used a few times, but without apparent advantage over the others: The sample is boiled with twenty times its weight of alcoholic solution of potassium hydroxid, of 5.00—8.00 per cent. alkali strength, in a flask under return condenser. Phosphoric acid is added in excess and the contents of the flask distilled with steam into a receiver containing a known quantity of decinormal alkali solution. To drive the acetic acid over completely requires distillation of about a liter of water. The same precautions are observed as in the preceding methods if halogens are present.

BROMIN DERIVATIVES OF KOLATANNIN.

The bromin compounds of this tannin have been investigated at considerable length, for the purpose of obtaining further data concerning its constitution.

Tribrom Kolatannin.

When bromin water is added to a water solution of kolatannin, a dark colored body is precipitated, and with continued addition of the reagent the precipitation goes on until complete, during which the precipitate formed becomes lighter colored until at the end, in the presence of an excess of bromin, it is pale brownish-yellow and further addition of bromin water produces no change. It is quite voluminous and cannot well be filtered at the pump, but is collected by ordinary filtration and well washed with water until the washings remain clear when treated with silver nitrate solution. It is dried first on porous plates, then in a vacuum desiccator to constant weight.

During the process of drying it gradually changes color until it becomes reddish-brown. It is odorless and nearly tasteless, insoluble in water, ether, chloroform and benzene, but is readily soluble in alcohol and in acetone.

In the clear filtrate, after the bromin compound has been removed, hydrobromic acid is easily identified, and for that reason the change is believed to be one of substitution. It may be questioned perhaps whether this is not caused by the action of bromin on the water; the bromin water, however, was freshly prepared, and the hydrobromic acid formed under these conditions would be very little. But in preparing twenty-five or thirty grammes of this bromin compound, after its precipitation the filtrate was agitated with carbon disulfid to remove the excess of bromin, then separated and the aqueous portion concentrated to small volume, which had an acid taste and reaction and in which hydrobromic acid was easily identified.

The bromin compound was analyzed with the following stated results:

	Found.			Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{17}Br_3O_8$.
Carbon	32.91	33.12	....	33.28
Hydrogen	2.69	2,58	....	2.95
Oxygen	22.86	22.63	....	22.19
As silver salt.				
Bromin	41.54	41.67	41.62	41.58

The percentage of carbon in this body, when compared with that of the pure tannin from which this was prepared, seemed to indicate the substitution of three hydrogen atoms by that number of bromin atoms.

Pentacetyl Tribrom Kolatannin.

From Tribrom Kolatannin.

For the purpose of obtaining further data, an acetyl compound of the bromin derivative was formed: The bromin compound is boiled with acetyl chlorid for about forty-five minutes, under a reflux condenser. An

equal volume of glacial acetic acid is added to the clear red solution and the liquid well cooled by freezing mixture. Then it is poured slowly into twelve or fifteen times its volume of ice-cold water, which is constantly stirred. A thermometer should be kept in the beaker containing the precipitate, and if the temperature rises above 10°, it is best to cool the contents by placing the beaker in freezing mixture, resuming addition of the acetyl chlorid on cooling, until all has been used. The acetyl compound separates as a flocculent yellow precipitate, is quickly filtered, well washed and dried, first on porous plates, then in a vacuum desiccator.

It is a tasteless, golden-yellow powder, having a faint odor of acetic acid. It is insoluble in water, nearly insoluble in ether, but soluble in alcohol, in acetone, and in chloroform. It loses acetic acid when gently heated, and both bromin and acetic acid on stronger heating. It was analyzed with the following stated results:

	Found		Calculated for $C_{16}H_{12}Br_3$-$(C_2H_3O)_5O_8$.
By combustion.	I.	II.	
Carbon	39.43	39.55	39.65
Hydrogen	3.44	3.34	3.44
Oxygen	26.57	26.65	26.43
As silver salt.			
Bromin	30.56	30.46	30.48
By saponification.			
Acetyl	26.91	27.12	27.32

The results obtained agree very closely with the calculated formula and give additional confirmation to the formulas assumed for the pure tannin and its tribrom compound.

Halogen Determination.

For the halogen determinations in the bromin compounds of kolatannin, the well known process of heating the halogen derivative with fuming nitric acid and silver nitrate in a sealed tube for two hours at 175° was followed. Experience taught us, however, to first make a preliminary determination with a considerable excess of silver nitrate to ascertain the approximate amount of halogen present. For example, where in one case the preliminary determination indicated 40.88 per cent. of bromin, the following ones in triplicate with only a slight excess of silver nitrate were respectively 41.54 per cent., 41.67 per cent., 41.62 per cent. And as a rule the preliminary determinations have given low results, but are necessary to furnish data for the second and more exact estimations.

Having learned the approximate amount of halogen present, the following details of manipulation were followed: The size of the sample taken is adjusted so that the weight of the resulting silver salt shall be 0.150 to 0.200 Gm. Six or eight per cent. more than the theoretical quantity of silver nitrate is now weighed and placed with the sample in a hard glass

tube with six Cc. fuming nitric acid, after which the tube is sealed and heated at 175°–180° for two hours. It is then opened and the contents are transferred to a beaker with about 100 Cc. water and heated on the water-bath for one half hour. The silver bromid is then collected on weighed asbestos filters connected with the pump, washed successively with hot water, alcohol and ether, and dried twenty or thirty minutes at 80°–85° to constant weight.

In some cases the excess of silver nitrate in filtrate was determined gravimetrically as silver chlorid for a check on the results.

Our thanks are due to Professor Edward D. Campbell of this University for many valuable suggestions on halogen and acetyl determinations.

Tribrom Pentacetyl Kolatannin.

(From Pentacetyl Kolatannin.)

Having acetylized the tribrom compound of tannin and obtained a pentacetyl derivative of it, we decided to brominate the pentacetyl compound and determine by analysis whether or not the resulting product was identical, in other words to ascertain whether the order in which the substitutions were made affected the result.

This bromination was accomplished by dissolving the pentacetyl tannin in strictly pure, anhydrous chloroform, free from alcohol, and adding a slight excess of bromin. The solvent was then distilled off in partial vacuum, while the brominated acetyl compound remained behind as a golden-yellow mass. This was treated with ether several times and redistilled, using the pump to remove the traces of chloroform, and finally transferred to a vacuum desiccator and left until completely dry.

In color, taste and solubilities this body is identical with that obtained by acetylizing the tribrom derivative. It was analyzed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{12}Br_3$-$(C_2H_3O)_5O_6$.
Carbon	39.49	39.62	39.65
Hydrogen	3.39	3.47	3.44
Oxygen	26.61	26.34	26.43
As silver salt.			
Bromin	30.51	30.57	30.48
By saponification.			
Acetyl	26.84	26.98	27.32

Inasmuch as the results of the analysis of this body coincide quite as closely with the theoretical figures as in the preceding case, it may be safely assumed that the bodies are identical and that in the preparation of a pentacetyl tribrom kolatannin it makes no difference whether the bromin or acetyl is introduced first.

Tetrabrom Kolatannin.

We next wished to ascertain whether this tannin was capable of taking more than three bromin atoms into combination in each molecule. Nothing but the tribrom derivative was formed by treating an aqueous solution of the tannin with bromin water in excess, so another solvent was tried successfully. Taking a weighed quantity of tannin, it was dissolved in alcohol and bromin was added gradually to the alcoholic solution in slight excess of the theoretical quantity necessary to form a tetrabrom derivative. The liquid remained clear, all the bromin compounds of kolatannin that we have yet prepared being easily soluble in alcohol. The bromin compound was precipitated by pouring the brominated alcoholic solution into twelve or fifteen volumes of ice-cold water; being insoluble in water, it was separated as a voluminous reddish-brown precipitate, which was filtered, washed and dried in the way already described under the method of preparation of tribrom kolatannin.

This body agrees in solubilities with the tribrom compound; it is slightly darker, however, and has a faint odor of bromin. It was analyzed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{16}Br_4O_8$.
Carbon	29.59	29.46	29.27
Hydrogen	2.46	2.38	2.44
Oxygen	18.97	18.88	19.52
As silver salt.			
Bromin	48.98	49.28	48.77

This, then, is a tetrabrom derivative of kolatannin. From it an acetyl compound was formed, following the manipulations already described.

Pentacetyl Tetrabrom Kolatannin.

This acetyl compound was yellow and but slightly darker than that of the tribrom derivative. In other physical properties it appeared identical with that body.

It was analyzed with the following stated results:

	Found.		Calculated for $C_{16}H_{11}Br_4$-$(C_2H_3O)_5O_8$.
By combustion.	I.	II.	
Carbon	35.82	35.97	36.03
Hydrogen	3.02	2.95	3.01
Oxygen	24.02	24.14	24.02
As silver salt.			
Bromin	37.14	36.94	36.94
By saponification.			
Acetyl	24.42	24.59	24.83

From the above it is seen that the tetrabrom derivative forms a pentacetyl compound equally as easily as the tribrom derivative.

Pentabrom Kolatannin.

This derivative was formed while trying to prepare a hexabrom substitution product, but by reason of an insufficiency of bromin the resulting product yielded analytical results corresponding fairly well with those calculated for pentabrom kolatannin.

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{15}Br_5O_8$.
Carbon	25.87	25.99	26.13
Hydrogen	2.07	1.86	2.04
Oxygen	17.35	17.31	17.42
As silver salt.			
Bromin	54.71	54.84	54.41

This body may be a mixture of the hexa- and tetrabrom tannins. It is somewhat difficult of formation, however, and we have not always been able to obtain it in a manner analogous to the methods of preparation of the other bromin compounds. We do not consider that all conditions necessary to its formation are yet understood. There is no good evidence that this is a mixture of the other derivatives, however, and for the present there is really no sufficient reason for mentioning it as other than a pentabrom tannin. It is soluble in the same agents as the other bromin compounds, and is less stable than the tetrabrom compound, the odor of bromin being much more distinct. It appears to be characteristic of these bodies, that with increasing percentage of bromin, there is decreasing stability (that is to say a greater tendency to lose bromin), and darker color.

Pentacetyl Pentabrom Kolatannin.

(From Pentabrom Kolatannin.)

This was prepared by acetylizing pentabrom kolatannin in the usual way. In properties and appearance it closely resembles the other bromacetyl derivatives, except that its color is somewhat darker yellow. It was analyzed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{10}Br_5(C_2H_3O)_5O_8$.
Carbon	33.54	33.39	33.02
Hydrogen	2.77	2.65	2.65
Oxygen	20.97	21.37	22.01
As silver salt.			
Bromin	42.72	42.59	42.32
By saponification.			
Acetyl	22.15	22.36	22.75

This body was also prepared from pentacetyl kolatannin, as stated next below.

Pentabrom Pentacetyl Kolatannin.

(From Pentacetyl Kolatannin.)

Having ascertained by previous experiment that addition of a considerable excess of bromin to an alcoholic solution of kolatannin, resulted in the formation of a hexabrom derivative, we wished to prepare a hexabrom pentacetyl derivative by brominating the pentacetyl derivative in the same manner.

Analysis of the resulting product showed, however, that contrary to our expectations, not a hexabrom but a pentabrom derivative, was formed, identical with the one described in the preceding section. The analytical results obtained were as follows:

	Found.		Calculated for $C_{16}H_{10}Br_5$-$(C_2H_3O)_5O_8$.
By combustion.	I.	II.	
Carbon	33.19	32.97	33.02
Hydrogen	2.60	2.71	2.65
Oxygen	21.90	21.95	22.01
As silver salt.			
Bromin	42.31	42.37	42.32
By saponification,			
Acetyl	22.31	22.47	22.75

Hexabrom Kolatannin.

By treating an alcoholic solution of kolatannin with bromin in considerable excess a hexabrom compound is formed, which is separated in the same way as the tetra- and pentabrom derivatives. It is darker colored than either of the others, has a very distinct odor of bromin and is soluble in the same media as the other bromin compounds. It was analyzed with results stated next below:

	Found.		Calculated for $C_{16}H_{14}Br_6O_8$.
By combustion.	I.	II.	
Carbon	23.48	23.57	23.59
Hydrogen	1.68	1.79	1.72
Oxygen	15.73	15.38	15.73
As silver salt.			
Bromin	59.11	59.26	58.96

Tetracetyl Hexabrom Kolatannin.

(From Hexabrom Kolatannin.)

This acetyl compound was prepared in the usual way, by boiling with acetyl chlorid, and was supposed, before analysis, to be a pentacetyl derivative. It had a dark yellow color, a faintly pungent taste and a slight odor of bromin and acetic acid. Soluble in chloroform and in alcohol, insoluble in water. The analytical results which are next stated show it to be a tetracetyl hexabrom tannin:

	Found. I.	Found. II.	Calculated for $C_{16}H_{10}Br_6(C_2H_3O)_4O_8$.
By combustion.			
Carbon	29.57	29.39	29.33
Hydrogen	2.21	2.32	2.25
Oxygen	19.41	19.21	19.55
As silver salt.			
Bromin	48.81	49.08	48.87
By saponification.			
Acetyl	16.86	17.19	17.52

Indications of Molecular Constitution.

From the analytical results of the pentacetyl pentabrom tannin and of the hexabrom compound with its tetracetyl derivative, it appears that the total number of groups or atoms which may be substituted in the way described is ten: that if five of acetyl be introduced first, only five bromin atoms may be substituted for hydrogen, but that if the bromin be introduced first, six bromin atoms can be introduced by carrying bromination to the limit, and in this hexabrom compound only four hydroxyl groups remain. This appears to indicate that the sixth bromin atom introduced bears a relation to the molecule in some respect different from that of any other bromin atom. But it might be expected that a limit would be reached in the total number of negative groups or atoms which can be retained in the molecule. The greatest number of acetyl groups probably indicates the entire number of hydroxyls. And a balance of evidence seems to favor the conclusion that there are six atoms of hydrogen directly united with the carbon of a benzene chain. These numbers are all in ratio to sixteen atoms of carbon. That the molecule contains C_{16}, or some multiple of this, appears from the quantitative results. We attempted to find the molecular weight of kolatannin, tribrom kolatannin and pentacetyl tribrom kolatannin by the cryoscopic method, but the results so far obtained are utterly meaningless. Further indications of molecular constitution may be drawn from a study of the anhydrids, account of which next follows, also from the results of the action of acids, and especially from the products by fusion with alkali, all stated further on in this paper.

THE ANHYDRIDS OF KOLATANNIN AND THEIR DERIVATIVES.

By judiciously heating kolatannin several anhydrids may be prepared, as described below, the amounts of water driven off varying with the temperature and the duration of its application. The first anhydrid of the series, that in which two molecules of tannin lose one molecule of water, and of which the empirical formula is $(C_{16}H_{19}O_7)_2O$, is formed by heating kolatannin at 107°–110° to constant weight. This anhydrid is darker colored than the tannin from which it is prepared and is less soluble in water: the second anhydrid, by an oversight, we did not attempt to prepare. If we may judge by the temperature required for the preparation of the first,

third and fourth members of the series, this one would result from heating the tannin a sufficient time at 120°–125°. Its theoretical formula is $C_{16}H_{18}O_7$. The third anhydrid $(C_{16}H_{17}O_6)_2O$ results from heating the tannin at 135°–140°. It is dark reddish-brown and nearly or quite insoluble in water. The fourth anhydrid, $C_{16}H_{16}O_6$, is dark brown, insoluble in water, and is the result of heating kolatannin two hours, at 155°–160°.

These anhydrids are all soluble in alcohol, and in solution of kolatannin of sufficient concentration.

First Anhydrid.

The method of preparation has been described in the preceding section. This is a yellowish-red body, soluble in water, in alcohol, and in dilute alkali solutions. The calculated loss of weight of the tannin in preparing this anhydrid was 2.65 per cent. The observed loss of weight was 2.77 per cent. The body was subjected to combustion with the following stated results:

	Found.		Calculated for
	I.	II.	$(C_{16}H_{19}O_7)_2O$.
Carbon	58.27	58.39	58.18
Hydrogen	5.38	5.61	5.45
Oxygen	36.35	36.00	36.37

First Anhydrid of Tribrom Kolatannin.

The first anhydrid of kolatannin was dissolved in water and precipitated by adding an excess of bromin, collecting the precipitate by filtration, and drying exactly as described in the method of preparation of tribrom kolatannin. It is soluble in the same media as tribrom kolatannin, is darker colored, is odorless and tasteless. Analysis of it proved it to be an anhydrid of tribrom kolatannin.

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{16}Br_3O_7)_2O$.
Carbon	33.61	33.80	33.86
Hydrogen	2.92	2.76	2.65
Oxygen	21.31	21.17	21.16
As silver salt.			
Bromin	42.16	42.27	42.33

First Anhydrid of Tetrabrom Kolatannin.

Prepared in the same way as tetrabrom kolatannin, using in this case the first anhydrid instead of kolatannin. It is hardly to be distinguished from the other tetrabrom compounds in appearance or other sensible properties. It was analyzed with the following stated results:

	Found.		Calculated for $(C_{16}H_{15}Br_4O_7)_2O$.
By combustion.	I.	II.	
Carbon	29.47	29.66	29.72
Hydrogen	2.37	2.21	2.17
Oxygen	18.57	18.42	18.58
As silver salt.			
Bromin	49.59	49.71	49.53

First Anhydrid of Hexabrom Kolatannin.

This was prepared by adding a considerable excess of bromin to the alboholic solution of the first anhydrid of kolatannin, and separating the product in the usual way. It is dark red, tasteless, and has a faint odor of bromin; is insoluble in water, ether and chloroform; soluble in alcohol and in dilute alkali solutions. It was analyzed with the followed stated results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{13}Br_6O_7)_2O$.
Carbon	23.96	24.15	23.88
Hydrogen	1.64	1.69	1.49
Oxygen	14.61	14.57	14.93
As silver salt.			
Bromin	59.79	59.59	59.70

Third Anhydrid of Kolatannin.

The method of preparation has been described. The calculated loss of weight on heating the tannin was 7.96 per cent.; the observed loss was 8.16 per cent. It is a red-brown powder, odorless, nearly tasteless, but somewhat astringent. Soluble in alcohol and in alkali solutions, insoluble in water, ether and chloroform. It was analyzed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{17}O_6)_2O$.
Carbon	61.72	61.80	61.54
Hydrogen	5.29	5.46	5.13
Oxygen	32.99	32.74	33.33

The bromin derivatives of this anhydrid, and those of the fourth anhydrid, to be described further on in these pages, were prepared in a manner strictly analogous to those already described.

Third Anhydrid of Tetrabrom Kolatannin.

A dark brown tasteless powder having a faint odor of bromin. Insoluble in water, ether or chloroform; soluble in alcohol and in alkali solutions. The analytical results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{13}Br_4O_6)_2O$.
Carbon	30.59	30.73	30.57
Hydrogen	1.99	1.81	1.91
Oxygen	16.32	16.19	16.56
As silver salt.			
Bromin	51.10	51.27	50.96

Third Anhydrid of Hexabrom Kolatannin.

A dark brown tasteless powder having a distinct odor of bromin. It is insoluble in water, ether and chloroform; soluble in alcohol and in alkali solutions.

The analytical results:

By combustion	Found. I.	II.	Calculated for $(C_{16}H_{11}Br_6O_6)_2O$.
Carbon	24.04	24.39	24.43
Hydrogen	1.52	1.38	1.27
Oxygen	13.22	12.88	13.23
As silver salt.			
Bromin	61.22	61.35	61.07

Fourth Anhydrid of Kolatannin.

This was prepared in the way previously described. The calculated loss of weight attendant upon its preparation from kolatannin is 10.61 per cent. The observed loss is 10.78 per cent. It is a dark brown, odorless, tasteless powder, soluble in alcohol and in alkali solutions; insoluble in water, in ether and in chloroform. It was analyzed with the following stated results:

	Found. I.	II.	Calculated for $C_{16}H_{16}O_6$.
Carbon	63.20	62.98	63.37
Hydrogen	5.09	5.16	4.95
Oxygen	31.71	31.86	31.68

Fourth Anhydrid of Tetrabrom Koiatannin.

A dark brown tasteless powder having a faint odor of bromin. Soluble in alcohol and in alkali solutions; insoluble in water, in ether and in chloroform. It was analyzed with the following stated results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{12}Br_4O_6$.
Carbon	30.91	30.68	31.02
Hydrogen	1.95	1.86	1.78
Oxygen	15.40	15.58	15.51
As silver salt.			
Bromin	51.74	51.88	51.69

Fourth Anhydrid of Hexabrom Kolatannin.

A very dark brown powder having a distinct odor of bromin. Soluble in the same media as the previously described bromin compounds. The analytical results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{10}Br_6O_6$.
Carbon	24.96	24.79	24.71
Hydrogen	1.39	1.31	1.16
Oxygen	11.70	12.01	12.35
As silver salt.			
Bromin	61.95	61.89	61.78

Products of the Action of Dilute Acids upon Kolatannin.

When kolatannin is boiled with dilute sulfuric or dilute hydrochloric acid, it first passes into solution, and on continued boiling a reddish precipitate is formed, which becomes gradually darker the longer the heating is kept up. This precipitate is collected by filtration and well washed with water, in which it is insoluble. It is also insoluble in alcohol, and only partially soluble in alkali solution. Combustions of this substance, while giving fair duplicates for the same sample, indicate that its composition is not uniform and constant. Samples numbers I. and IV. were prepared by boiling kolatannin with six per cent. sulfuric acid, in a flask fitted with a return condenser; number II. by heating the tannin and dilute acid in a sealed tube; number III. by boiling the tannin and dilute acid in a beaker with occasional addition of water to compensate for evaporation; number V. by boiling caffein tannate with dilute acid in a flask fitted with return condenser; number VI. is the result of combustion of a similar substance made and reported last year.*

	I. Av. of 2.	II. Av. of 2.	III. Av. of 2.	IV. Av. of 2.	V. Av. of 2.	VI. Av. of 2.
C	53.60	50.45	51.27	56.38	54.49	69.20
H	5.34	4.85	5.24	5.69	5.87	6.70
O	41.06	44.70	43.49	37.93	39.64	24.10

The aqueous filtrate was shaken out with ether, the residue after evaporation of the ethereal solution was re-dissolved in water and boiled a short time, which caused precipitation of the coloring matter. Then filtering, it was again extracted with ether, and the operation repeated several times. At length the ethereal solution left a nearly colorless residue on evaporation, which responded to the tests for protocatechuic acid. Oak bark tannin also, when subjected to similar treatment with dilute mineral acids, yields protocatechuic acid.

Etti, Böttinger and Löwe each mention the insoluble red body formed from oak tannin on boiling it with dilute acids and consider it an anhydrid. They do not agree on which of the anhydrids it is, however. In fact as already mentioned there were many points in their work on tannins on which they were at variance. Etti† found gallic acid in the acid filtrate. Löwe‡ does not mention having examined the liquid for bodies other than sugar. Trimble,§ however, whose work is the most recent, found protocatechuic acid as a by-product, in every case. He does not commit himself on the question of whether the dark brown, amorphous, insoluble substance separated from tannin by the action of hot dilute acids is an anhydrid.

Whatever may be the relation of the body separated in this way from

* Knox and Prescott, 1896: Proc. Am. Pharm. Assoc. 44, p. 136.

† C. Etti, 1884: Berichte 17, p. 1820.

‡ J. Löwe, 1881: Zeitschrift f. Anal. Chem. 20, p. 208.

§ H. Trimble: "The Tannins," II, p. 92.

oak bark tannin to the original tannin, there does not as yet seem to us to be any good reason for considering the corresponding substance precipitated from acid solutions of kolatannin, an anhydrid of kolatannin. The evidence thus far is against it. Boiling with dilute mineral acids is in general a means of hydrolysis, rather than anhydrolysis, we would therefore expect saponification instead of anhydrid-formation: as a matter of fact an aromatic acid—protocatechuic—has been found in the acid filtrate after collecting the insoluble red substance in question, while if the reaction were one of simple anhydrid formation, no by-products should be present. If the red-brown substance were an anhydrid of kolatannin, we would expect it to have a higher percentage of carbon than the original tannin, but in most cases combustion indicates a lower percentage of carbon. We would also expect to find the body of uniform composition when prepared by similar means, but the analyses just mentioned show that it is very variable in content of carbon and hydrogen, while its appearance also varies from red to dark brown. At present no more can be said of this body than we have already said, viz., that it is red or dark brown, amorphous, insoluble in water, in alcohol, in ether and in chloroform, only partially soluble in dilute alkali, and that it is a decomposition product obtained by boiling kolatannin, or caffein kolatannate, with dilute mineral acids.

Knebel's * "kolaroth" is a body obtained in the same way, except that he prepared it from caffein kolatannate, or as he supposed "kolanin," which was the alleged "caffein-bearing glucosid" of kola. Inasmuch as the free tannin of kola and that combined with caffein are identical, as will appear further on in these pages, it makes no difference which kind of it is used for this purpose. Knebel, however, worked with caffein tannate from the dried drug, while our work has been entirely on that from the fresh drug. He fails to give the figures of his combustions, but Hilger † reports the following stated results:

	Found. I.	Found. II.	Calculated for $C_{14}H_{18}(OH)_5$.
Carbon	63.09	62.65	63.16
Hydrogen	6.85	6.50	6.75
Oxygen	30.06	30.85	30.09

This calculated formula does not differ widely in carbon content from that calculated for the fourth anhydrid of kolatannin, $C_{16}H_{16}O_6$.

	Calculated for $C_{16}H_{16}O_6$.
Carbon	63.37
Hydrogen	4.95
Oxygen	31.68

The hydrogen is rather high, however, which makes the oxygen correspondingly low. The results of an analysis of a body like the one Hilger

* E. Knebel, 1892; Apoth. Zeitung 7, p. 112.

† A. Hilger, 1893; Vierteljahr. f. öffentl. Gesundpflg. 25, p. 559.

analyzed might have been construed to indicate it as a member of the anhydrid series, and inasmuch as he found a substance yielding analytical figures nearly coinciding with those just given for the fourth anhydrid, it is perfectly reasonable to suppose that if we had made combustions of a larger number of samples, we might have obtained some results which could be used in support of the idea that these decomposition products of tannins are simple anhydrids of them. Our experience has taught us that the composition of this product is by no means constant with the means used in its preparation, and we saw no good reason for selecting the figures of one combustion from those of a dozen others presumably as near correct, merely to give support to a theory.

It is somewhat puzzling that Knebel and Hilger have found this body of uniform composition. As a matter of fact Knebel reports no figures in support of his claim, and Hilger reports only two combustions, still it would be supposed that before assigning a formula to a body of this kind a larger number of combustions would have been made, and with different samples. We do not feel justified in accepting the formula $C_{14}H_{13}(OH)_5$ proposed by them for it, nor do we at present possess sufficient data for a formula. We do not even know that it is not a mixture of two or more substances; and although we have not made any separation of them, it seems to us more probable than otherwise that it is a mixture in varying proportions of certain products of decomposition of kolatannin.

The suggestion of Knebel that the tannin of kola is an oxidation product of "kolaroth" according to the equation

$$\underset{\text{Kola red}}{C_{14}H_{13}(OH)_5}+4O_2=\underset{\text{Gallotannic acid}}{C_{14}H_{10}O_9}+4H_2O$$

is untenable for the two-fold reason that we do not find kolatannin or this decomposition product of it to be so readily oxidizable as stated by him, and furthermore, that kolatannin is not identical with gallotannic acid, the formula of which he has given in the above equation as the formula of kolatannin, nor have we at any time found any gallotannic acid present in kola.

Knebel claims to have prepared a pure product of his kolaroth from the acetyl compound of it; and he further claims that the exact separation of kolaroth may be had by boiling his so-called "kolanin" (caffein kolatannate) with acetyl chlorid, whereby an acetyl compound of "kola red" is formed, and is separated by pouring the mixture of acetyl chlorid and caffein kolatannate into water. The acetyl compound of kola red is thus precipitated and the glucose and caffein pass into solution.

Let us examine this statement in the light of the recent knowledge of the chemistry of this interesting drug. First, as conclusively proven by us last year, the body called "kolanin" is not a glucosid composed of caffein, glucose and "kola red," but is a combination of caffein with the tannin of kola, $C_{16}H_{15}O_3(OH)_5$, and with anhydrids of that tannin, in varying proportions, depending largely on the method used to separate it from the

drug. And it contains no glucose whatever, for we have since learned that the evidence of sugar found in it and in free kolatannin last year and reported in our paper was due to the accidental presence of glucose from a faulty method of separation. Moreover, acetyl chlorid does not effect an exact separation of the caffein from this combination. We prepared an acetyl derivative of caffein kolatannate exactly as done with the other acetyl products and analyzed it, with the following results:

Carbon	58.30
Hydrogen	4.85
Nitrogen	2.54
Oxygen	34.31

The nitrogen content corresponds to 8.79 per cent. of caffein. The caffein kolatannate from which this acetyl compound was made contained 6.53 per cent. nitrogen, corresponding to 22.6 per cent. caffein. Caffein was also found in the liquid from which the acetyl compound was filtered. The separation then is not complete and the acetyl compound is not a pure acetyl compound of caffein kolatannate, nor was it expected to be; for as caffein kolatannate contains kolatannin and some of its anhydrids, both capable of forming acetyl compounds, it naturally follows that any acetyl derivative prepared will not be a simple derivative of one of the bodies, as stated by Knebel, but will be a mixture of acetyl derivatives of the tannin and its anhydrids, probably in the proportions in which they existed prior to the operation. With this understanding of it, it is difficult to see how Knebel could have prepared the pure and simple acetyl compound in the way stated by him.

The Question of Sugar Production.

Results were obtained in our work last year which seemed to indicate that kolatannin was a glucosidal body. We wished to investigate this question more fully, and have done so in the following described way:

Kolatannin was dissolved in water and precipitated by lead acetate, the collected lead salt was washed with water for several hours; the lead salt was then decomposed by dilute sulfuric acid, the lead sulfate filtered out, and the acid filtrate boiled for four hours in a flask fitted with a return condenser. The acid strength was supposed to be about 5–6 per cent. The insoluble matter was filtered out, the acid removed by addition of barium carbonate, and the liquid again filtered; the coloring matter was precipitated by lead acetate and the precipitate removed by filtration, after which the remaining lead acetate was removed by hydrogen sulfid. The filtrate was boiled to remove all the hydrogen sulfid and made alkaline with a little sodium hydroxid solution. The liquid was still slightly colored. It was tested with Fehling's solution, and gave a red precipitate. A portion of it made slightly acid with acetic acid gave negative results when the osazone test was applied, and a control test made at the same

time, using a little solution of grape sugar in addition, gave the well-known yellow precipitate. This showed that there was no interference with the phenylhydrazin test. Basic lead acetate solution was added, which precipitated the traces of coloring matter in the solution, and, after removing the excess of lead, the solution was tested with Fehling's solution again, with negative results this time.

This experiment was repeated in a slightly different way, as follows: The well-washed lead salt of about one gramme kolatannin was heated for two hours at 110° C. in a sealed tube with 30 Cc. hydrochloric acid, the tube then opened and the contents filtered to remove lead chlorid and the amorphous red decomposition product of kolatannin. The filtrate was red colored and was shaken out several times with ether. The ethereal solutions were set aside for further examination. The filtrate was then boiled to remove the traces of ether, and exactly neutralized with sodium hydroxid, after which basic lead acetate solution was added until no further precipitation occurred, the precipitate removed by filtration, and the excess of lead salt precipitated as lead sulfate by cautious addition of dilute sulfuric acid. The solution was again filtered, made slightly alkaline with sodium hydroxid solution, and tested with Fehling's solution with negative results.

The importance of using basic lead acetate to precipitate the coloring matter is shown by the fact that if only normal acetate be used, a small amount of coloring matter is left in solution and gives a precipitate with Fehling's solution, while if basic lead acetate be employed, all the coloring matter is removed and the copper solution is not affected.

In the ethereal solution, protocatechuic acid in small quantity was found, as stated in another part of this paper.

The experiments described having given negative results, the interpretation is made that kolatannin is not a glucosid, and that the evidence we had to the contrary last year was caused by the incomplete removal of the glucose of the plant, due to a faulty method of separation for the tannin, since discarded by us.

It is significant that this result places kolatannin in a category and gives it a character essentially different from the character of caffeotannic acid, as understood by the chemical world from the report of Hlasiwetz.

Action of Fused Alkali.

Fifteen grammes kolatannin were fused for two hours with potassium hydroxid, the fused mass cooled and acidulated with sulfuric acid, after dissolving it in water. Without filtering the mixture, it was shaken out with ether, the successive portions of this solvent united and evaporated. The residue was distinctly crystalline, the crystals assuming an arborescent form for the most part. This residue was purified several times by recrystallization, after which it was dissolved in water and submitted to tests Protocatechuic acid and phloroglucin were found to be present.

Action of Heated Glycerin.

One gramme kolatannin was heated with three Cc. glycerin in a porcelain capsule for twenty minutes at 195°–200°. Fifty Cc. water were then added and the mixture was shaken out with ether. The residue left on evaporating the ethereal extract was found to contain protocatechuic acid, by chemical tests.

KOLATANNIN FROM CAFFEIN KOLATANNATE.

It has thus far not been found practicable to substitute other means of separation of this tannin from its caffein salt for the treatment by lead hydroxid, although the disadvantages of this agent are fully appreciated. It is, however, much preferable to lead acetate in this particular case, as lead acetate precipitates some caffein tannate along with the lead tannate, and the resulting tannin is apt to be contaminated accordingly.

Preparation of the Sample.

The caffein tannate is dried on porous plates and finely powdered and sifted; it is then washed with a mixture of ether and chloroform to remove any traces of adhering fat, and dried again. It is then washed with ice-cold water by agitation, drained and washed again until the washings give no precipitate of silver chlorid on being treated with solution of silver nitrate acidulated with nitric acid. The caffein kolatannate is now dissolved in dilute alcohol, making a very concentrated solution; this solution is filtered and poured into ten or twelve times its volume of ice-cold water, whereupon the caffein compound is re-precipitated. It is collected by filtration, drained well and re-dissolved in dilute alcohol, using gentle heat on the water bath. Freshly precipitated lead hydroxid triturated to a smooth paste with warm alcohol is now added in excess and the mixture warmed on the water bath for a few minutes, with stirring. The precipitate is now allowed to subside and if sufficient lead hydroxid has been added the supernatant liquid will be colorless or faintly straw colored, while the precipitate of lead kolatannate mixed with lead hydroxid forms a compact magma at the bottom of the container. The liquid, which contains kola alkaloids, is poured off and the precipitate is washed repeatedly with dilute alcohol, first by decantation and then by filtration, until several Cc. of the filtrate evaporated in a porcelain dish leave no perceptible residue and give no test for caffein. The precipitate is compact and is much more readily washed than that given by lead acetate. It is then suspended in dilute alcohol and treated with hydrogen sulfid until the tannin is all liberated. The lead sulfid is then filtered out and washed with dilute alcohol until the washings are colorless. The filtrate is concentrated by distillation in vacuo to small volume, and eight or ten volumes of water are added. This precipitates a reddish mass, a mixture of certain anhydrids of kolatannin, which is filtered out and set aside. The filtrate

containing tannin together with dissolved anhydrids is now shaken with ether once or twice, and the washings thrown away. Then ethyl acetate is added and the tannin separated and purified in the way already described, under the method of preparation of kolatannin.

This "combined" kolatannin, although not quite as light colored as the "free" tannin, shares all its reactions and solubilities.

Combustion of "Combined" Kolatannin.

It was analyzed by combustion and the following results obtained, which coincide very closely with those resulting from combustion of the "free" tannin:

	Found.			Calculated for
	I.	II.	III.	$C_{16}H_{20}O_8$.
Carbon	56.53	56.78	56.42	56.45
Hydrogen	5.68	5.79	5.74	5.90
Oxygen	37.79	37.43	37.84	37.65

The Pentacetyl Compound.

This was prepared in the same manner as the other acetyl derivatives and is identical with the pentacetyl compound of "free" kolatannin, heretofore described.

The analytical results are as follows:

	Found.			Calculated for $C_{16}H_{15}$-$(C_2H_3O)_5O_8$.
By combustion.	I.	II.	III.	
Carbon	56.75	56.44	56.61	56.72
Hydrogen	5.54	5.41	5.31	5.47
Oxygen	37.71	38.15	38.08	37.81
By saponification.				
Acetyl	38.27	38.53	38.68	39.09

The Bromin Compounds.

These were prepared in identically the same way as the corresponding ones of the free tannin. In appearance and properties there seems to be no difference between these and those of free kolatannin, and for the sake of brevity we shall omit further description and confine ourselves merely to the statement of analytical results, in each case.

Tribrom Derivative.

	Found.			Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{17}Br_3O_8$.
Carbon	33.09	33.25	.....	33.28
Hydrogen	2.84	2.98	.....	2.95
Oxygen	22.50	22.13	....	22.19
As silver salt.				
Bromin	41.57	41.64	41.74	41.58

Pentacetyl Tribrom Derivative.

(Formed by acetylizing the tribrom derivative.)

	Found.			Calculated for $C_{16}H_{12}Br_3(C_2H_3O)_5O_8$.
By combustion.	I.	II.	III.	
Carbon	39.64	39.82	.....	39.65
Hydrogen	3.47	3.61	.....	3.44
Oxygen	26.44	25.94	.....	26.43
As silver salt.				
Bromin	30.45	30.63	30.71	30.48
By saponification.				
Acetyl	26.66	26.97	....	27.32

Tribrom Pentacetyl Derivative.

(Formed by brominating the pentacetyl derivative.)

	Found.			Calculated for $C_{16}H_{12}Br_3(C_2H_3O)_5O_8$.
By combustion.	I.	II.	III.	
Carbon	39.88	40.15	.....	39.65
Hydrogen	3.26	3.45	.....	3.44
Oxygen	26.34	25.74	.....	26.43
As silver salt.				
Bromin	30.52	30.66	30.57	30.48
By saponification.				
Acetyl	26.78	27.04	.....	27.32

Tetrabrom Derivative.

	Found.		Calculated for $C_{16}H_{16}Br_4O_8$.
By combustion.	I.	II.	
Carbon	29.13	29.35	29.27
Hydrogen	2.29	2.46	2.44
Oxygen	19.86	19.30	19.52
As silver salt.			
Bromin	48.72	48.89	48.77

Pentacetyl Tetrabrom Derivative.

	Found.		Calculated for $C_{16}H_{11}Br_4(C_2H_3O)_5O_8$.
By combustion.	I.	II.	
Carbon	36.12	36.33	36.03
Hydrogen	2.78	2.96	3.01
Oxygen	24.33	23.78	24.02
As silver salt.			
Bromin	36.77	36.93	36.94
By saponification.			
Acetyl	24.64	24.78	24.83

Pentabrom Pentacetyl Derivative.

(Formed by brominating the pentacetyl derivative.]

	Found. I.	Found. II.	Calculated for $C_{16}H_{10}Br_5$-$(C_2H_3O)_5O_8$.
By combustion.			
Carbon	33.23	32.98	33.02
Hydrogen	2.62	2.72	2.65
Oxygen	21.71	21.78	22.01
As silver salt.			
Bromin	42.44	42.52	42.32
By saponification.			
Acetyl	22.49	22.26	22.75

Hexabrom Derivative.

	Found. I.	Found. II.	Calculated for $C_{16}H_{14}Br_6O_8$.
By combustion.			
Carbon	23.85	23.68	23.59
Hydrogen	1.77	1.83	1.72
Oxygen	14.76	14.72	15.73
As silver salt.			
Bromin	59.62	59.77	58.96

Tetracetyl Hexabrom Derivative.

	Found. I.	Found. II.	Calculated for $C_{16}H_{10}Br_6$. $(C_2H_3O)_4O_8$.
By combustion.			
Carbon	29.66	29.92	29.33
Hydrogen	2.46	2.29	2.25
Oxygen	18.73	18.55	19.55
As silver salt.			
Bromin	49.15	49.24	48.87
By saponification.			
Acetyl	16.48	16.73	17.52

Kolatannin Anhydrids obtained from Caffein Kolatannate.

The insoluble, reddish-brown precipitate formed on addition of cold water to the tannin solution after the separation of the tannin from its lead salt, as mentioned in the method of preparation of "combined" kolatannin, was well washed and dried at 100°. Combustion of this showed a carbon percentage intermediate between that of the second and third anhydrids of kolatannin.

As the solubilities of the anhydrids appear to be about the same, we were unable to effect a separation of them, and for this reason we heated the (supposed) mixture at 135°–140° to constant weight, in order to convert it all if possible into the third anhydrid. It was then subjected to another combustion with the following results:

	Found. I.	Found. II.	Calculated for $(C_{16}H_{17}O_6)_2O$.
Carbon	61.27	61.46	61.54
Hydrogen	5.28	5.43	5.13
Oxygen	33.45	33.11	33.33

These results agree very well with the calculated formula and with those obtained by combustion of the third anhydrid of so-called "free" tannin of kola.

The identity of the tannin of caffein tannate with the free tannin having been positively settled by the analyses already given, and by one or two evidences yet to be stated, it was deemed unnecessary to make a further comparative study of its bromin derivatives.

Action of Dilute Acids.

The experiments described as having been performed on "free" kolatannin were repeated on this kind of kolatannin, also with parallel results. The same is to be said of the products of fusion with potassium hydroxid and of heating with glycerin.

Further Indications of Molecular Constitution.

Whether there be a carboxyl in kolatannin or not, remains open to question and to further determinations. Its moderate acid character is not inconsistent with the negative polarity of a polyhydric phenol reinforced by the oxygen of an anhydrid group, yet destitute of entire carboxyl. Our numerous analyses of kolatannin and its several derivatives as described in this paper are in close agreement with a polyhydric phenol anhydrid, carrying two methyl groups and one methoxy group, but standing altogether as a di-addition benzene derivative, two such benzene nuclei pairing together in an ester-like anhydrid. On this supposition, a monomethyl dihydrogen trihydroxy benzoic acid has paired ester-wise with a monomethyl methoxy di-hydrogen trivalent phenol. The di-additive benzene constitution is not improbable among plant constituents of this class, finding parallel in the additive structure of the terpenes. If we admit the hypothesis of the molecular formula above indicated, we must predicate that one of the six hydrogen atoms joined to benzene-carbon is in position somewhat unfavorable to its bromin substitution, and when brominated quite preventing the acetylization of one of the hydroxyls. Finally, it remains entirely without proof as to the distribution of the hydroxyl and methoxyl groups between the two benzene nuclei.

$$\begin{matrix} C_6H_3(CH_3)(OH)_3 & CO \\ & \vert \\ C_6H_3(CH_3)(OCH_3)(OH)_2 & O \end{matrix} = C_{16}H_{20}O_8$$

As to Chemical Bearings upon Pharmacology.

Finally, it must be admitted that the stable caffein compound of an acid of such marked chemical individuality as that of kolatannin can by no means be assumed to have the same physiological effects as free caffein. And this subject is one of pharmacological importance for the caffein of all the beverage plants.

We are under many obligations to Mr. James Heggie, B. S., for his very efficient assistance in preparing and analyzing the various derivatives of tannin reported in the preceding pages.

DISCUSSION OF RECENT ASSAY METHODS.

Within the past year two processes for the assay of kola have been offered, which seem to us not to be free from objections. We give below the essential points of these methods without entering into unimportant details.

*Method of Jean.**

The author ascribes his plan of procedure in part to MM. Chodat and Chuit. He boils the dried and powdered drug with "milk of lime," dries the whole in an oven and powders it again. This powder is exhausted with chloroform, which removes the free alkaloids. The chloroform is evaporated to dryness, the residue dissolved in hot water and filtered. The filtrate is evaporated to dryness and weighed as caffein.

For "kolanin:" the drug after treatment with chloroform is extracted with alcohol, the alcohol evaporated from the percolate and the soft extract remaining is dissolved in boiling water, which solution, after cooling, is filtered. The insoluble matter remaining on the filter is dried in an oven and weighed as "kolanin."

The most serious defects in the above described method are (1) the boiling with "milk of lime," (2) the prolonged heating necessary to dry the drug after that treatment, (3) weighing the caffein instead of estimating it with Wagner's reagent volumetrically, (4) the means employed to separate so-called "kolanin," (5) estimating caffein kolatannate ("kolanin") by weight as such, instead of by its caffein content.

(1) Boiling with "milk of lime," or other aqueous alkalies, tends to decompose caffein—a fact too well known to require further comment. This treatment also tends to liberate caffein from its tannate, and thus prevents an exact determination of the proportion of "free" to "combined" alkaloids that originally existed in the drug. The starch of kola, amounting to nearly forty per cent.,† causes the drug to become of a jelly-like consistence when boiled with aqueous liquids, and when dried the mass is very hard to powder, and even when powdered the condition of it is well cal-

* J. Jean, 1896: Repert. de Pharm. (3), 7, p. 49.

† Knox and Schlotterbeck, 1895: Proc. Am. Pharm. Assoc., p. 334.

culated to resist the penetrating action of the solvent, and thus cause incomplete extraction.

(2) The gelatinous condition of the drug after boiling with "lime water" renders it hard to dry completely, and as very prolonged heating is necessary, there is danger of loss of caffein by sublimation.

(3) We do not consider that the alkaloids of kola are sufficiently pure when removed in this, the usual manner, to be weighed as such. Gomberg's* volumetric method gives more accurate results.

(4) If any caffein kolatannate escapes decomposition during the first part of the assay, which will occasionally happen, it is removed by the extraction with alcohol. But as it is somewhat soluble in water and more soluble in aqueous solutions containing tannin, the directions to collect and weigh the portion left undissolved by water will generally be found superfluous, for the small amount of it present will generally pass into and remain in solution. Dieterich† had this experience, and met with nothing but disappointment in trying to estimate caffein kolatannate by this method.

(5) Caffein kolatannate has been shown to be a body of somewhat variable composition, with a caffein content ranging from 19 to 25 per cent. Inasmuch as the value of kola as a stimulant probably depends primarily on its percentage of caffein, and as the weight of its caffein compound indicates only approximately the amount of its combined caffein, there would not seem to be any reason for attaching much importance to the weight of this compound, if a very precise valuation of the drug is desired. We hold that a direct estimation of the caffein of this compound is preferable and at least as expeditious.

Method of Carles.‡

Ten grammes kola, one gramme calcium hydroxid, and twenty grammes 80 per cent. alcohol, are mixed together and dried on the water bath until the weight is reduced to fourteen grammes. The mixture is then powdered and transferred to a 100 Cc. flask containing 35 Cc. of a mixture of 100 parts chloroform and 20 parts alcohol, and heated one hour on a water bath. After filtration the residue is extracted next with 20 Cc. of the same solvent, and finally with 10 Cc. The united extracts are evaporated to dryness, and the residue taken up with 10 Cc. boiling water containing four or five drops of 1 per cent. sulfuric acid, then with 6 Cc., and finally with 5 Cc. The solutions are united, filtered, evaporated to constant weight, and weighed as caffein.

For "kolanin," which the author recognizes as caffein kolatannate, another sample of the drug is taken and extracted with water to remove the caffein and other soluble constituents. The drug is next extracted with 70 per cent. alcohol, the extract evaporated to dryness, transferred to a filter,

* M. Gomberg, 1896: J. Am. Chem. Soc., 18, p. 331.

† Dieterich, 1896: Ch. Centralbl. II., p. 675.

‡ P. Carles, 1896: Jour. de Pharm. et de Chim. 16, p. 104.

washed with cold water, then dried at gentle heat and weighed. If it be desired to estimate the alkaloids of this compound, one gramme "kolanin," one gramme calcium hydroxid and three grammes chalk with a little 70 per cent. alcohol are mixed together and evaporated on the water bath to about six grammes, and extracted with alcoholic chloroform in the manner already described.

The objections to this method are in part among those already mentioned in the discussion of Jean's method. The use of lime or other alkalies in the assay of a caffein-bearing drug is to be deprecated. The solvent used is not a proper one for the reason that sufficient alcohol is present to extract other constituents in addition to the alkaloids, which are not removed from the caffein during the subsequent treatment of the residue, and which, when weighed with the caffein, lead to erroneous results. Moreover, the manner of applying the menstruum is inconvenient, does not insure complete extraction, and is in no way preferable to the ordinary extraction by the use of Soxhlet's apparatus. The addition of the sulfuric acid is unnecessary and does not add to the purity of the final product, which is dark-colored and very plainly impure. The objection to weighing a final residue as caffein finds especial application in this method.

As the properties of caffein kolatannate had not been made known very generally at the time of publication of these methods, there is some excuse for the assumption of both these writers that it is wholly insoluble. Carles has proceeded on this hypothesis in directing the drug to be extracted with cold water to remove the water-soluble constituents before exhausting it with alcohol to remove the caffein compound, but inasmuch as caffein kolatannate is not only somewhat soluble in water, but considerably more soluble in solutions of caffein and of tannin, the extraction of kola by water will remove a considerable amount of it. The same is to be said of the final washing of the caffein compound with water, which is quite inadmissible in quantitative work. Carles seems to have recognized the uncertain value of gravimetric determinations of caffein kolatannate, and is to be commended for offering an alternate method providing for its valuation according to the amount of its alkaloids.

At our request Mr. James W. Cobb, Ph. C., has assayed a sample of dried kola by each of the foregoing methods and by the method adopted by us last year,* after thoroughly familiarizing himself with them by preliminary work.

	Method of Jean.		Method of Carles.		Knox and Prescott.	
	I.	II.	I.	II.	I.	II.
Caffein by weight......	1.93	1.79	2.16	2.33	....	....
The same titrated	1.83	1.71	1.87	1.98	1.96	1.88
"Kolanin"	none	none	2.89	3.17	....	...
Combined alkaloids....	...	....	....	....	1.62	1.61
Alkaloids of "kolanin"	...	....	.59	.69	....	....
Total alkaloids......	1.83	1.71	2.46	2.67	3.58	3.49

* Knox and Prescott, 1896: Proc. A. Ph. A. 44, p. 136.

It will be seen that the impurity of caffein separated by Jean's method amounts to 4.84 per cent., and that of the caffein by Carles' method amounts to 14.25 per cent., which was determined by titrating the caffein with Wagner's reagent, after Gomberg's method.

Both methods give very low results as compared with those obtained by our own. They are tedious and otherwise unsatisfactory, in addition.

Further notes on the assay of kola are in preparation.

All the work reported upon in this paper has been done under the provision of the Stearns Fellowship of the University of Michigan.

Ann Arbor, Mich., July 3, 1897.

After some remarks by Mr. Kremers upon Kunz-Krause's recent work on caffeotannic acid, it was moved by Mr. Dohme that the paper be received and referred to the Committee on Publication.

Motion was seconded and prevailed.

THE CHAIRMAN: The next paper will be that of Mr. Krueger on "Why a Pharmacist should be a Bacteriologist."

MR. HALLBERG: I would like to call the attention of the members to Article IV., Chapter IX., of the By-Laws.

THE CHAIRMAN: The article to which Prof. Hallberg refers is in regard to the limiting of time to each paper to ten minutes. The time being so short, we must enforce that article.

WHY A PHARMACIST SHOULD BE A BACTERIOLOGIST.

BY OWEN W. KRUEGER, PH. D., M. D., KANSAS CITY, MO.

Bacteriological examinations and urinary analyses are paramount factors in the art of distinguishing diseases, being in some cases helpful and in some absolutely essential. Comparatively few physicians are familiar with bacteriological methods of examination, and fewer pharmacists. This is a stubborn fact, existing in opposition to the multitudinous imperative demands for scientific and skilful methods of diagnosis to check the ravages of disease, and it seems strange to me that physicians do not manifest greater anxiety and interest in acquiring a thorough knowledge of that most certain of all means of diagnosis—bacteriology. I have seen men studying their friends' dispositions to take advantage of them. I have seen diseases creep with the silent tread of a cat into the human organism, and send the sexton into the cemetery to prepare the grave; not because there was no cure for the disease, but because it was not known what the disease was until it was too late to cure it. Certainly the fox is no more cunning, artful and sly than consumption, and no certain diagnosis of this disease in its incipient state can be had except by bacteriological examination. The same is true of ophthalmia neonatorum, typhoid fever, diphtheria, and many other equally treacherous and destructive maladies—heirlooms of the flesh.

Long experience has demonstrated that it is expedient, and in some cases even necessary, for the pharmacist to be familiar with the principal methods of urinary analysis in order to assist the physician in diagnosing diseases. Experience during the past ten years has also demonstrated that bacteriological methods of examination have acquired equal rank and importance. These two factors, in their peculiar degrees, are of chemical nature and require laboratory experience, chemical agents, etc.

I want to assign a few very good reasons why the pharmacist should extend his sphere of knowledge and usefulness to the department of bacteriology. In order to be an up-to-date co-worker with an up-to-date physician, the pharmacist must become a bacteriologist. During the past two years I have made bacteriological examinations for many physicians of Kansas City, and am convinced that I have been of great assistance to them by the material benefit they have been to me, for they have manifested their gratitude in manifold sincere and remunerative ways. Comparatively few physicians are acquainted with bacteriological methods of examination, and the great majority of them have to depend wholly upon the small minority, or the up-to-date pharmacist. The small minority of physicians who are able to make these examinations are practitioners of prominence, and because of their eminence and all-absorbing practice they welcome the opportunity to delegate the work to the pharmacist, whose compensation is always adequate and consists of good-will and increased volume of business.

To the pharmacist who loves his profession and business these bacteriological investigations are of intense interest theoretically, and my experience has proven conclusively that the practical benefits can neither be enumerated nor estimated. A little extra time is required and a little more comprehensive knowledge of the workings of the microscope; but are not these attributes of a modern pharmacist, and do they not bring him into closer relationship with the profession upon which his own success so largely depends? I realize that many towns are so small that bacteriological patronage might not prove remunerative as a special department, but the subject itself is of vast importance, and we should not look altogether to immediate results. A little more time at school and the pharmacist becomes a bacteriologist, and bacteriology as a part of pharmacy might save a life—even a village.

There may be some present who do not deem it necessary for the pharmacist to burden himself with knowledge for the sake of the physician.

Gentlemen, aside from the benefits that inure to the community and pharmacist, occasions often arise when the pharmacist without a knowledge of bacteriology may suffer irreparable injury, when a knowledge of this branch of science would afford him satisfaction and protection. I have in mind a case where a pharmacist dispensed a box of "Fairchild's Peptogenic Powder," which the physician claimed was undergoing bac-

terial decomposition and had produced in his patient very serious symptoms of ptomaine poisoning, almost resulting in this instance in death. A knowledge on the part of the pharmacist of this branch of science would have enabled him to determine the accuracy or fallacy of the physician's opinion, and would have afforded self-protection and preservation of his reputation. But he was obliged to bear the odium, and suffer the loss of prestige and business. This is one instance. No doubt many others arise where bacteriology is of service to the pharmacist when called upon to make examinations of food products, water, etc., to determine their healthfulness.

Having given a few of the prominent reasons why a pharmacist should be able to make these bacteriological examinations, I shall endeavor to give brief descriptions of the principal diseases that are distinguished by the aid of bacteriology, of the germs which cause these diseases, and of the most practical methods of staining and recognizing them.

The principal disease in which bacteriology has become the most important means of diagnosis is consumption or tuberculosis, not only of the lungs, but of any other organ of the body. This disease, as you are aware, is caused by a rod-like germ, called tubercle bacillus, discovered by Koch in 1882. This germ can be found in the diseased organs or in the secretions emanating therefrom, and when once discovered the diagnosis of tuberculosis is absolute. To make the examination is by no means difficult nor very time-robbing. I take the sputum, which is suspected to contain tubercle bacilli, a small quantity, place it on a cover glass, spread it very thin, let it become dry, and draw it three times through the alcohol flame to fix it. I then put on a few drops or staining fluid (Ziehl's solution), hold the cover glass above the flame until it bubbles or fumes arise, and set aside for five minutes. I then decolorize it by washing in a 25 per cent. solution of nitric acid, rinsing in a 60 per cent. solution of alcohol, transferring to absolute alcohol, and then rinsing in water. I then re-stain it with an aqueous solution of methylene blue, making everything blue except the tubercle bacilli, which remain red. Examined now under the microscope I find a beautiful double stain, in which the red tubercle bacilli stand out exquisitely in the blue stained material. If only such bacillus retains the red color after passing through the different decolorizing agents, the diagnosis of tuberculosis is certain.

Another disease which the bacteriologist is often called upon to diagnose for the physician is ophthalmia neonatorum. This disease is caused by a germ which has the form of a roll.

I place a little of the suspected material upon a cover glass, subject it to the same process, and stain it with either an aqueous solution of methylene blue or fuchsin. The microscopic revelation of diplococci establishes the diagnosis.

Among all the diseases with which the bacteriologist has to contend,

there is probably not one the diagnosis of which is awaited with greater anxiety by the family and physician than diphtheria. It is caused by a thin rod-like germ, called Klebs-Loeffler bacillus, which is found in the diphtheritic membrane. The prompt recognition of this disease is of the utmost importance, because mistake and delay invariably result in breaking the family circle. If it is discovered and the serum applied in time, we have to-day an infallible remedy for a disease which has hitherto been the dread and anxiety of every physician and parent; and thus is realized the physician's hope, that if God would grant him one wish, it would be that he might have the power to stamp out those infectious and contagious diseases that fill the mother's eyes with tears and many a grave with curly heads and dimpled cheeks.

To make a bacteriological examination of diphtheria it is necessary to obtain a culture from the patient's throat, and for this reason I believe drug stores are incomplete unless equipped with blood serum tubes and sterilized cotton swabs for the immediate use of physicians in removing the membrane to be returned to the bacteriologist for examination. After a microscopic examination of the membrane the bacteriologist should, in order to more fully demonstrate his diagnosis to the physician, grow a culture of the germs by placing the tube containing the blood serum and membrane in an incubator at 99° F. and permitting it to remain therein from six to eighteen hours. If, upon subsequent examination of the round colonies upon the surface of the blood serum, Klebs-Loeffler bacilli are found in either the membrane or culture, the diagnosis is established beyond doubt.

One of the latest discoveries in bacteriology relates to the diagnosis of typhoid fever by the blood serum test. To redissolve a drop of suspected blood (which has been received on a piece of folded sterilized paper by the bacteriologist from the physician) add a drop of sterilized water; then mix a drop of this blood solution with a drop of 24-hours typhoid bouillon culture, and examine it. If it is typhoid fever the typhoid bacilli will at first exhibit great activity, then become agglutinated, and ultimately cease moving within 15 to 60 minutes subsequent to admixtion. To facilitate the general and practical application of this most important test I believe that every drug store should be equipped with sterilized paper in envelopes, which physicians can procure and return with the blood to the bacteriologists for examination.

Much more could be said in this connection, but I have already taxed your patience too much. My object was to show how important and beneficial it might become to the pharmacist to be acquainted with these methods of examination, and how comparatively easy it is to make them. If I have succeeded in this, I feel well repaid for the effort I have made.

(Applause.)

It was moved and seconded that the paper be received and referred to the Publication Committee.

THE CHAIRMAN: As a matter of information I would like to state that already one college of pharmacy has introduced bacteriology in its course of study—the College of Pharmacy of New York City.

MR. WHELPLEY: Mr. Chairman, before the discussion is closed I would like to ask the author one question that may bring out information of value to the retail pharmacists, and that is an estimate of the probable expense for equipment for this work, and also the average fee that can be obtained from the physicians for the work.

MR. KRUEGER: I think with a microscope that a laboratory could be fitted out for $150, and I will state that the fees range from $5 upward for all examinations.

THE CHAIRMAN: For the information of Dr. Whelpley I would state that I have in my pharmacy a complete outfit for such work. The complete outfit I think does not exceed in cost $300, of which the microscope alone is $175. It is the most expensive kind in the market, but a cheaper one would answer just as well. The incubator is the second large item which costs about $50, but much smaller ones and cheaper ones would answer all purposes. Of course to that must be added the number of test solutions which are supposed to be present in every chemical laboratory. The fee ranges in our laboratory from $5 to $50 for such work. We have made a great number of vital tests for $10, and no physician has ever objected. For tuberculosis we get $10 every time, and nobody has ever objected to it. Of course there is other work which is done for less than that. It is not only an interesting work but very remunerative. I consider the bacteriological department in my establishment the best paying department.

MR. WHELPLEY: There is no doubt but that the time is coming, and not very far distant, when bacteriological work will be quite prominent in pharmacy; and one reason why I asked the question which I did was to have placed on record in connection with this paper as complete statistics as possible, that we could in time to come look back towards the beginning of this work and see how changes have been made. I can personally attest to the author's statement that $150 will cover the absolute necessary expense of such an equipment. It is the minimum amount, and from that up to $300 will cover all that is perhaps desirable.

MR. PRESCOTT: I can say also, Mr. Chairman, that there is at the present time a very great interest in bacteriology on the part of students in the schools of pharmacy, and on the part of young men looking toward further training in the practice of pharmacy. The interest is wide-spread, and it is interesting, and certainly I should hope that there would be no school of pharmacy without opportunities for the teaching of bacteriology. At the same time, Mr. Chairman, we should remember that to be a thorough expert in bacteriology is not a small matter; that it really requires with it histology, physiology and anatomy, and should logically be accompanied by pharmacology. We should also remember that students of pharmacy looking forward to further analytical work have a good many open fields of importance before them. In pharmaceutical assay and in other branches I think we must recognize that the student of pharmacy must specialize this man for this thing, and that man for that thing, and I don't think that every pharmacist can become an expert bacteriologist. I think that every large pharmacy doing business for physicians in a large city should in the future have a bacteriologist among the number of its employees. (Applause.)

MR. HALLBERG: Mr. President, we have in Chicago at present several institutions located in large office buildings, notably one where there are one hundred and five physicians. There is what is known as the Columbus Medical Laboratory. Three gentlemen are in charge of it—a bacteriologist, a chemist, and, I believe, one other expert. There

are several institutions like that in Chicago. Now, that shows that there is a certain field for that kind of service for the medical profession, and that certainly an attempt should be made on the part of pharmacists to give that service, and not have simply chemists and other specialists furnish it. I, therefore, consider it is very important that this ought to be added as a feature to the pharmaceutical instructions in the various institutions throughout the country.

THE CHAIRMAN: It has been moved and seconded that the paper be received and referred to the Committee on Publication.

Motion prevailed.

Mr. Kremers read the introduction to a paper by himself on Volatile Oils, stating that the work in connection with this subject had not yet been completed, and that the paper would be sent to the Publication Committee later.

MR. HALLBERG: Mr. Chairman, I make the motion that we now hear the report of the Research Committee.

Motion was seconded by Mr. Sayre and prevailed.

MR. PRESCOTT: This report is, as you remember, the second annual report of the Special Committee of Research, a report due to this Section of the Association.

REPORT OF THE SPECIAL COMMITTEE ON RESEARCH.

To the Scientific Section:

The Chairman of this Committee begs leave to submit its second annual report* as follows:

The work in hand by this Committee during the year 1896–97 has been under the following named heads:

1. *Volatile Oils and their Pharmacopœial Assay.* To include two queries referred to this Committee by the Section, in its action upon the report of the Committee on the Revision of the United States Pharmacopœia a year ago,† namely:

(1) "Percentage valuation and limitation of the essential constituents of volatile oils" at large.

"Report on the constitution of the commercial oil of bay," as a specified particular study, which might indeed be included under the general head last above.

This important and almost limitless subject of research is in the hands of Prof. Edward Kremers. In the pure chemistry of this subject he has been engaged some nine or ten years, beginning his work in connection with Professor Wallach, of Goettingen, and lately he has devoted himself especially to the bearings of research upon the pharmacopœial assay of essential oils. He has a report to make at this meeting.

2. "*Standards for linseed, white and black mustard seed,* giving a maximum percentage of foreign matter allowed." A topic assigned to this Committee by the Section in its action upon the report of the Committee on the Revision of the United States Pharmacopœia, a year ago,‡ and accepted for black and white mustard seed by Prof. John U. Lloyd, who has the work in progress.

3. "*Standards for powdered acacia and gamboge,* giving limitation of amount of starch

* For first annual report see "Proceedings American Pharmaceutical Association, 1896," p. 128.

† Proceedings American Pharmaceutical Association, 1896, p. 134.

‡ Proceedings American Pharmaceutical Association, 1896, p. 135.

allowable," a topic assigned to this Committee in the same way as the two last named above. A bibliography of the subject has been made under direction of the Chairman.

4. "*An Investigation of Syrups made with Cane Sugar*, and report on the desirability of using glycerin in place of cane sugar for syrups," has been requested of this Committee by the Scientific Section.*

A bibliography of the subject has been prepared, and some experimentation made, the subject being continued by the committee.

5. *The Chemistry of Cascara Sagrada, and its chief constituents.* In this subject, which is wholly in the hands of Dr. A. R. L. Dohme, a bibliography was prepared under direction of the Chairman last year, and we have great pleasure in announcing a paper of interest by Dr. Dohme at this time. He desires to do further work, especially upon the constitution of purshianic acid, and the committee very much desire him to continue the research.

6. *The Chemistry of Taraxacum.* Professor Sayre has been deeply interested and thoroughly engaged in this important subject this year, and has the co-operation of Prof. Lloyd. Last year a quite careful bibliography of the literature was prepared under the direction of the Chairman. A paper by Prof. Sayre, we are glad to say, is now presented to this Section.

7. *The Perhalides of Alkaloids, in relation to their volumetric estimation.* In continuation of the work under this head, reference should be made to the reprints herewith presented of an article on "Halides and Perhalides of Pyridine "† in work done under the direction of the Chairman. Also reprints of an article a few months earlier, upon "The Periodides of Pyridine."‡ Nearly a year ago there were forwarded to the Committee of Revision of the United States Pharmacopœia, the reprints of a series of articles by the Chairman on "The Periodides of the Alkaloids, as Molecular Forms for Volumetric Estimation."§ At this meeting is presented an article on "Alkyl Bismuth Iodides and Dragendorff's Reagent for Alkaloids," by A. B. Prescott and O. C. Diehl. The material is ready for another paper upon "Atropine and Morphine Perhalides and the Estimation of these Alkaloids by Kippenberger's method," this paper being promised as subject to the Publication Committee. The work on these subjects has been carried out by P. F. Trowbridge, B. S., and O. C. Diehl, Ph. C., with assistance by Mr. R. E. Knapp and Mr. A. D. Sturgis. Acknowledgment is also due to Mr. J. B. Keating and to Mr. W. J. O'Brien for parts of the work.

8. *Alkaloidal Combinations in Caffeine-bearing Plants.* In continuation of this work is now presented an article by J. W. T. Knox and A. B. Prescott. Thanks are due to James Heggie, B. S., for assistance. The research discloses a distinct tannin of constant composition not before reported, and indicating the desirability of work upon caffeotannic acid and the tannins of tea. The combinations in question are doubtless influential in the pharmacology of the beverage plants.

9. *Aralia Nudicaulis.* By William C. Alpers and Benjamin L. Murray. An experimental study of the botany and chemistry of the "wild sarsaparilla," indigenous to the United States, and sometimes appearing as an adulterant of official sarsaparilla, also known in domestic medicine.

10. *The Comparative Structure of Hyoscyamus, Belladonna and Stramonium Leaves.* By Julius O. Schlotterbeck. A study in the search of effective pharmacopœial distinctions for these leaves.

11. *The Toxic Action of Phenols on Living Plants.* By R. H. True.

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* Proceedings American Pharmaceutical Association, 1896, pp. 127, 135.

† J. Am. Chem. Soc., July, 1897, Vol. xix., pp. 558–574.

‡ *Loc. cit.*, April, 1897.

§ Phar. Review, Vol. xiv. Reprints, 47 pages.

A Chemical Bibliography of Morphine, 1875 to 1896. This bibliography has been prepared by H. E. Brown, B. S., under direction of the chairman, for the uses of research upon assay of alkaloidals, including their chemistry in full. Embracing the literature on analytical chemistry, it is especially careful upon the literature of chemical structure. Sixteen periodicals, five in English, three in French, and eight in German, were taken as sources, and the abstracts in the bibliography were made independently from the originals. The author-index gives 169 names; the subject-index about 150 entries. The order of the bibliography itself is chronological. If published in the Proceedings, it would take about 55 pages. If deemed too bulky for the Proceedings, the Committee will ask the Committee of Revision of the Pharmacopœia to print it separately.

In conclusion, the undersigned begs to say, as in effect was said in last year's report (Proceedings A. Ph. A., 1896, p. 131), that this Committee can only hope to do something, not everything, in "the concentration and co-ordination of certain scientific work, in a more special way than the Committee on Scientific Papers, with the entire Section upon their hands, can be expected to do;" while "the stated supply of original literature to workers in research" is the first-named function of the Committee.

Acknowledgment is due to Messrs. Merck & Co. for their liberality in supplying to the Committee an order-list of alkaloids for laboratory work, without payment.

According to the organization of this Committee as made last year by this Section (Proceedings A. Ph. A., 1896, p. 135), the terms of service of two of its members, Messrs. Kremers and Coblentz, now expire, and election of two members of the Committee is called for at this meeting. In its present organization the members are Messrs. John U. Lloyd, Edward Kremers, Virgil Coblentz, and A. B. Prescott.

Submitted by

August, 1897. ALBERT B. PRESCOTT, *Chairman.*

(Applause.)

MR. HALLBERG: Mr. Chairman, I move that the report of the Research Committee be accepted with thanks and the recommendations be concurred in.

Motion was seconded by Mr. Good and prevailed.

MR. PRESCOTT: I now move, Mr. Chairman, that we proceed to the election of two members on the Research Committee in place of Prof. Kremers and Prof. Coblentz.

MR. HALLBERG: I second the motion.

THE CHAIRMAN: The remaining members are Prof. Prescott and Prof. Lloyd, and the Chairman of the Section is always a member *ex officio.* Nominations are now in order.

MR. HALLBERG: I desire to place in nomination Edward Kremers.

MR. PRESCOTT: I take great pleasure in seconding the nomination.

MR. CASPARI: Mr. Chairman, Dr. Alfred Dohme, I think, was the originator of this plan, and I take pleasure in presenting his name.

MR. MAYO: I second that nomination.

On motion, duly seconded, the nominations were closed.

MR. FEIL: I now move that the Secretary cast the ballot for the two candidates nominated.

Motion duly seconded and prevailed.

The Secretary here cast the ballot for Messrs. Kremers and Dohme and they were duly declared elected.

MR. PRESCOTT: The term of service is, by rule of this Section, two years.

MR. GOOD: Mr. Chairman, there is a possibility of a vacancy in this Committee during the intervals between the meetings of our Association, and I move that the Chairman of the Committee be given authority to fill any vacancy in the Committee which may occur during the intervals of the meetings, until the next meeting.

Motion was seconded by Mr. Werner and prevailed.

MR. HALLBERG: I move, Mr. Chairman, that half an hour be now devoted to the discussion of the Report of the Committee on the Revision of the Pharmacopœia, which has been referred to this Section.

Motion was duly seconded and prevailed.

Mr. Eliel, chairman of the committee, read the following report:

REPORT OF THE COMMITTEE ON THE REVISION OF THE PHARMACOPŒIA.

Your Committee on the Revision of the United States Pharmacopœia respectfully submits the following:

Podophyllum. As podophyllin is the active principle, a podophyllin requirement should be established. Even though but little of the root or extract of it is used, it is in the line of advanced ideas and brings our Pharmacopœia abreast with our knowledge of to-day to have incorporated in it such facts as we know. As the process of assaying the drug and obtaining the purified podophyllin U. S. P. is a simple one, it should be adopted as such, or in a modified form. Four per cent. of purified U. S. P. podophyllin appears to be an average good yield from resinous prime root.

Prunus Virginiana. Wild cherry bark has been investigated by members of our Association, and it has been established that the bark can readily be assayed and its value be determined. A process of assay should be adopted and a standard hydrocyanic acid requirement be established.

Sanguinaria. Blood root has an active principle, sanguinarine, and as this can readily be determined a process of assay should be adopted and a sanguinarine requirement established.

Sarsaparilla, *Quillaya* and *Senega* have similar properties, and their active principles are similar and allied. These principles should be investigated and closely compared. Methods of assay and standard requirements should be established so as to give pharmacists a means of determining their merits and value, independently of the crude microscopical methods now necessarily only employed and which can have no real value. If, as has been maintained, soap bark and senega root have the same therapeutic value and can be interchanged, the more valuable one should be determined and adopted, and the less valuable one dropped.

Strophanthus. The most valuable variety of this drug should be adopted and the less valuable varieties excluded by the Pharmacopœia, and a method of assay for determining the strophanthin adopted as well as a minimum content of the same.

Syrupus Acidi Hydriodici is not a stable preparation, and it is doubtful if it can be made such. A concentrated solution of hydriodic acid can be made that is stable, and from which the syrup can be made as wanted for dispensing. Such a solution should be substituted for the syrup.

Syrup of Garlic. This syrup is practically obsolete as far as usefulness is concerned. It hence has no longer any excuse for being in the Pharmacopœia, and should be dropped. But if retained in the Pharmacopœia the quantity of dilute acetic acid should be reduced; for if made with a good quality of garlic, the finished product, according to quantities now directed to be used, will yield about 100 Cc. more than the 1000 Cc. which the Pharmacopœia directs.

Vanillin has been recognized as the odoriferous and valuable principle of vanilla beans, and is a definite chemical compound whose purity can readily be determined. It should be made official, especially as its use is becoming general among pharmacists.

Mucilago Acaciæ may be kept for an indefinite time if 25 per cent. of the water directed to be used is replaced with Liquor Calcis, and we recommend its adoption in the Pharmacopœia.

Tinctura Moschi. The pharmacopœial requirement of 5 per cent. strength is too great and wasteful, as this amount of musk will not be exhausted by the process now directed. The strength should be reduced to 2 per cent., and 100 Cc. of the water replaced by Liquor Calcis.

Methyl Alcohol may now be obtained of a high degree of purity, and the use of such purified wood alcohol should be sanctioned in the manufacture of such preparations as Linimentum Saponis, Linimentum Saponis Mollis, Linimentum Sinapis Compositum, Spiritus Myrciæ, Tinctura Arnicæ Florum, Tinctura Benzoini, Tinctura Cantharidis, and Tinctura Iodi. Samples of these preparations made with purified wood alcohol are herewith submitted for inspection.

It was the intention to submit at this meeting a line of samples of fluid and solid extracts of alkaloidal drugs made with wood alcohol as a solvent, but in order to obtain trustworthy results we find that individual experiments have to be repeated a great many times. The practability of using methyl alcohol in the manufacture of Alkaloidal Solid Extracts was tested on the following drugs:

Aconite, Belladonna, Cinchona, Henbane and Stramonium. Methyl alcohol does wholly extract the alkaloids of these drugs.

The first and the second 100 Cc. of percolate were assayed with the following results:

DRUG.	First 100 Cc. of Ethyl Percolate.	First 100 Cc. of Methyl Percolate.
Aconite	0.49 Gm. Total Alkaloid.	0.43 Gm. Total Alkaloid.
Belladonna	0.437 Gm. Total Alkaloid.	0.458 Gm. Total Alkaloid.
Nux Vomica	1.437 Gm. Total Alkaloid.	1.427 Gm. Total Alkaloid.
Cinchona	Data not at hand.	

DRUG.	Second 100 Cc. of Ethyl Percolate.	Second 100 Cc. of Methyl Percolate.
Aconite	0.135 Gm. Total Alkaloid.	0.135 Gm. Total Alkaloid.
Belladonna	.0578 Gm. Total Alkaloid.	.04814 Gm. Total Alkaloid.
Nux Vomica	.733 Gm. Total Alkaloid.	.668 Gm. Total Alkaloid.
Cinchona.		

The total alkaloidal strength of the drugs operated on was also ascertained. The data are not at hand, but will be used later.

The solvent power of methyl alcohol for non-alkaloidal plant constituents is not identical with the solvent power of ethyl alcohol. As a consequence, the mass of extract obtained from a given quantity of drug is not the same as that obtained from the same quantity of drug by means of an ethyl alcohol menstruum. *The dose of the extract would therefore have to be changed, if methyl alcohol be adopted as solvent.*

Results showing weight of extract, calculated *pilular* extract, obtained from 100 Gm. of drug in case of ethyl menstruum and in case of methyl menstruum:

Drug.	Ethyl Extract.	Methyl Extract.
Aconite	7.57 Gm.	14 Gm.
Belladonna	54 Gm.	25.708 Gm.
Nux Vomica	12.55 Gm.	20.4 Gm.
Cinchona	54.62 Gm.	53.134 Gm.

Note: In these experiments the drugs were *completely* exhausted.

In case of Aconite, Belladonna, Nux Vomica and Cinchona, the volume of menstruum for *total* exhaustion was ascertained. Two portions of the drug (100 Gm. each) were packed in separate percolators, and were exhausted under the same conditions and at the same rate of flow—one portion being exhausted with official menstruum, the other with a menstruum differing from the official in containing Methyl Alcohol (Columbian Spt.) in place of official Ethyl Alcohol.

The percolation was conducted with ordinary percolators, and in the manner ordinarily employed by pharmacists who follow the specifications of the U. S. P.

RESULTS.

DRUG.	Volume of Menstruum required for Total Exhaustion.	
	Ethyl Menstruum.	Methyl Menstruum.
Aconite	450 Cc.	550 Cc.
Belladonna	695 Cc.	700 Cc.
Nux Vomica	950 Cc.	1060 Cc.
Cinchona	Data not at hand.	

The Committee is under obligations to the Department of Pharmacy of Purdue University for the work and data in connection with tests of Methyl Alcohol in the manufacture of Alkaloidal Solid Extracts, and to the Manhattan Spirit Co. for their liberality in furnishing the amount of purified Methyl Alcohol required.

LEO ELIEL,
A. R. L. DOHME,
E. H. BARTLEY,
A. B. STEVENS,
W. M. SEARBY.

MR. RYAN: In connection with this report on the amount of resin in podophyllum I would say that the time of collection of the root is a very important item. The usual yield of resin is a little over four per cent.—about four and a quarter per cent.

when worked on a large scale; but it has been found recently in a very large lot that the yield was only three and a quarter per cent., due probably to the difference in the time of collection. The root that was gathered in the spring yielded much less resin.

MR. ELIEL: I desire to say of the experiment, as far as the extraction of drugs with methyl alcohol is concerned, that while the results so far obtained are before you, this is only the beginning. I have, on behalf of the Committee, made an arrangement for a complete and exhaustive research work in this matter, and we expect the Committee on the Revision of the United States Pharmacopœia, whoever they may be, will report further progress at the next meeting.

MR. SADTLER: I would like to ask Mr. Eliel a question. It is this: Whether this methyl alcohol was absolutely free from any other products, such as acetone—in other words, whether by fractional distillation they have assured themselves that it was free from products other than methyl alcohol and water.

MR. ELIEL: I desire to say in reply that the experiments, so far as the extraction of alkaloidal drugs are concerned, were conducted at Purdue University, Lafayette, Ind., and were under the charge of Prof. Stuermer, and that he did make an examination and an analysis in the manner asked for, and he reports it to be an absolutely pure methyl alcohol, without anything else in it.

MR. SAYRE: Mr. President, I should like to state that an examination of the Columbian Spirit has been made and the report published in the proceedings of Kansas State Pharmaceutical Association. It has been found that there is a trace of acetone in Columbian Spirit, but practically the statement is made that it is pure and just as it is represented.

MR. SADTLER: Mr. Chairman, I have made an examination of that Spirit, and it surprised me thoroughly, from the fact that I couldn't find a trace of acetone in it.

MR. PUCKNER: In reference to whether methyl alcohol is poisonous, I would say that I have tried the alcohol to a limited extent upon myself. I have taken the purified methyl alcohol as much as 33 Cc. at one dose, then upon further experiment took the same amount of Columbian Spirit. The effect was very slight—slight increase in the temperature and a very slight increase in the pulse. Later on I took doses of this alcohol, 15 Cc., half an hour apart for three hours, that is, took six 15 Cc. doses, with the effect at first of a slight increase in the pulse, later a slighter decrease. The same effect would have occurred probably, in my opinion, by the same quantity of 50 per cent. alcohol—that is, apparently the toxic effect seems to be the same—the effect is similar. It has been tried by investigators on dogs, as well as men, and found to be non-poisonous, both ethyl and methyl alcohol having about the same effect.

MR. HALLBERG: Mr. Chairman, I have a letter from a well-known physician in Aurora, Ill., who made a post mortem examination on two persons, a man and a woman, who had died after drinking ten ounces of wood alcohol. I can not find the letter now, but I have it in my possession somewhere. This is only one case out of three that have resulted in death in Illinois during the last six months. This doctor reports, at my request, that he made the autopsy the morning following, when the man and wife were found dead after drinking ten ounces of wood alcohol during the preceding night, and the examination, to his mind, showed conclusively that death was due to the drinking of this alcohol. The alcohol was bought from a well-known wholesale drug house in Chicago and it was stated to be commercial wood alcohol—probably not this Columbian Spirit, but just commerrial wood alcohol; and I think it is a pretty serious question as to how to use this wood alcohol, be it purified or not.

MR. KREMERS: Mr. Chairman, I would like to say in regard to the experiments that Mr. Puckner has made, that there has recently appeared the statement, based upon evidence, that methyl alcohol is less toxic than any of the other alcohols. The experiments made upon himself seem to verify this general statement, and I should like to inquire what the effect of ten ounces of ordinary alcohol would be. (Laughter.)

MR. HALLBERG: Mr. Chairman, wood alcohol is used for tincture of iodine. Now, I have in my possession a bottle which contains eight ounces of tincture of iodine made with this wood alcohol the first week in January. By this time it is almost colorless. The cork is not stained, the solution does not stain the skin perceptibly. It has a very strong, irritating odor, and apparently it has not any of the properties of tincture of iodine made with ethyl alcohol. The specimen which the chairman (Mr. Eliel) has in his hands is only two months old, and it probably has not undergone decomposition sufficiently.

MR. ELIEL: Mr. Chairman, I desire to say that this was made on or about the 15th day of May, and it has been standing in the store exposed to the action of sunlight and heat, and there has been no care taken of it at all, and all that I did to it before sending it up here was to simply wash off the dust and re-label it. The odor is just as perfect to-day as though it had been made yesterday, and if some gentleman here in the city of Minneapolis, or elsewhere, will take charge of this bottle and keep it and report on it next year, I would be very glad to turn it over to him.

MR. EBERT: Mr. Chairman, I have a sample of tincture of iodine made with methyl alcohol in my store, a pint of it in a quart bottle, which I tested in the presence of some gentlemen—I believe some are right here—to show that the tincture of iodine is absolutely as good, the stain as permanent a one as any other, and it seems to be just as good now as on the day I made it, in January last. I move that we receive the Committee's report, and that it be printed.

Motion was seconded and prevailed.

At the request of the Chairman, Prof. Sadtler then read his paper on Peanut Oil, as follows:

PEANUT OIL AND ITS USES IN PHARMACY AND THE ARTS.

BY SAMUEL P. SADTLER.

The ordinary peanut or "earthnut," is the seed vessel and seed of *Arachis hypogæa* (Leguminosæ), a plant largely cultivated on the west coast of Africa, in India and in the Southern Atlantic States. The nuts vary quite appreciably in the quality and yield of oil obtainable from them. Thus Consul Mason, in the United States Consular Reports for April, 1894, gives the following statement of their relative value as sources of oil:

The principal varieties are graded in the market according to richness in oil and general merit as follows (the percentage being based upon equal weights of shelled kernels in condition for grinding):

Senegal peanuts	51 per cent.
Congo peanuts	49 per cent.
East African peanuts	49 per cent.
Bombay peanuts	44 per cent.
Madras peanuts	43 per cent.
American peanuts	42 per cent.

As to quality of oil this report ranks the African first (at a price from 56 cents to $1.00 per gallon); the American next (at 59 cents per gallon), and the East Indian last (ranging from 40 to 50 cents per gallon).

Spanish nuts are not mentioned in this report of Consul Mason. A report of Consul Thomas (United States Consular Reports, July, 1894), mentions them as furnishing a small part of the imports at Marseilles, but gives no statement of their relative rank or price. The quality of the oil undoubtedly differs somewhat according to the locality whence the nuts are obtained, but these differences are not so great as those dependent on the condition of expression and care in the choice of sound nuts.

The "cold drawn" oil of the first expression is a very pale yellow and has a pleasant taste resembling the flavor of kidney beans. It is used in both France and Germany as salad oil, and no doubt comes to us from Marseilles in considerable amounts under the label of "virgin olive oil." The oil obtained by second expression also serves as table oil as well as for burning. The third quality expressed at higher temperature is chiefly used for soap making, for which it is a very satisfactory raw material. In fact, much of the finest soap made at Marseilles is now made from the peanut oil which is expressed there on an immense scale from African or East Indian nuts.

From a chemical point of view, peanut oil is distinguished from the other oils of the olive oil group in containing the glycerides of two of the higher fatty acids of the saturated series, viz.: arachidic acid, $C_{20}H_{40}O_2$, and lignoceric acid, $C_{24}H_{48}O_2$, along with oleic acid of the unsaturated series.

The percentage of free fatty acids in the cold pressed oil is very slight, usually less than 1 per cent., and if the oil is freed from this by treatment with a little aqueous alkali, it will preserve its sweetness of taste and freedom from rancidity much longer than most of the fatty oils.

As regards its physical properties, its specific gravity ranges from 0.911 for the best African cold pressed oil to 0.9209 for dark colored hot pressed oil.

The cold test, or beginning of turbidity from the separation of solid particles, also varies according to the quality of the oil. The best African oil is given a cold test of $+ 2°$ C. (35.6° F.), the best Indian oil $+ 5°$ C. (41° F.), while a dark colored hot pressed oil showed $+ 10°$ C. (50° F.).

I have recently had occasion to examine some samples of American peanut oil, expressed at Norfolk, Va., from Virginia peanuts wholly or in part. I will state the results of their analysis in tabular form, placing alongside for comparison some partial analyses of peanut oil from foreign sources, and then speak of some of its practical uses.

	Oil from Virginia nuts.	Oil from Spanish nuts.	Oil from African nuts.	Oil from Pondicherry.	Commercial oil.
Specific gravity at 15°C.......	0.917	0.9175	0.911	0.920	0.9209
Saponification value..........	192.53	190.68	194.	193.1	192.1
Iodine value................	91.75	94.17	85.6	95.	98.4
Hehner value (percentage of insoluble acids)............	94.87	95.34	......	......	95.86
Reichert-Meissl value.........	0.484	1.60	......	......	......
Percentage of free acid as oleic	0.546	0.791	0.62	......	6.20
Cold test of the oil...........	+3° C.	+3° C.	+2° C.	......	+10° C.
Maumené test................	56.75° C.	......	......	49° C.	45.5° C.
Melting point of fatty acids....	29° C.	34° C.	30° C.	29° C.	28° C.
Solidifying point of fatty acids..	27.5° C.	32.5°C.	29°C.	25° C.	25° C.

The production of peanut oil in this country has hitherto been, as far as I know, only carried on in a desultory way, and it has not been much known as a commercial article. However, as the chemical composition of the peanut has become better known, attention has been drawn to the food value of the peanut meal and the peanut grits. It has been found that they are richer in nitrogenous principles than any of the vegetable seed cakes, and a demand has sprung up for them. So the expression of the oil has now been undertaken on a larger scale and with more suitably designed presses.

The sample I show here is cold-pressed oil from Virginia peanuts, and about 38 per cent. by weight is obtained in the first cold-pressing. By a second hot-pressing nearly 10 per cent. more could be obtained. The cold-pressed oil is, as seen, of a pale yellow color, and of pleasant flavor and odor. A very slight refining makes from it a very agreeable table oil for salads and general culinary purposes. It has already been noted with the European peanut oil (and I can confirm it from my experiments with the American oil) that, when once freed from the free acid found in the raw state, it does not tend to become rancid as easily as olive oil. I have exposed samples to strong sunlight for weeks without developing the slightest rancidity.

Now, as there is an abundant American product (I believe the annual product of Virginia and North Carolina peanuts is over two million bushels), why should it not be used in pharmacy where olive oil is now used? I made up, in an experimental way, a soda soap from this oil, a sample of which is shown, and a sample of the lead plaster from the same. With this latter for comparison is put lead plaster made from a sample of pure California olive oil. While no particular care was taken with these samples, I think they show that the peanut oil will make at least as good a product as the official olive oil.

As regards the soap, it is an open secret that the bulk of the Castile soap made in Marseilles to-day is made from African peanut oil.

I may say in conclusion that when I asked permission of the company who are now starting in to manufacture this oil in this country to present this account of my examination of the oil before this body of pharmacists, I was told that they would cheerfully send samples of the oil in response to inquiries from any one interested.

(Applause.)

On motion, duly seconded, the paper was accepted and referred for publication.

Mr. Feil next read the following paper:

PRACTICAL NOTES.

BY JOSEPH FEIL, PH. G.

Tincture of Iodine.—A long series of experiments seems to indicate that under the ordinary conditions of most drug stores this substance will remain of U. S. P. strength for about one month—that is to say, if the bottle is opened once or twice a day, and if kept on a shelf exposed to diffused daylight; if, however, the container is kept in a dark closet, exposed to the same conditions of occasionally being opened, it remains unchanged for two months. I would suggest that the U. S. P. require the preparation to be kept in a dark place.

Tincture of Opium.—The powdered opium of the market has been very frequently examined in late years, and all practically agree that there are two qualities prepared and sold; one containing 13 to 13½ per cent. morphine, just meeting the U. S. P. requirement, and the other quality averaging 16 per cent. morphine, therefore exceeding the demand of strength. Notwithstanding these facts, the tincture of opium found in pharmacies is in very many instances below the requirement in morphine strength; this can be due to two causes, first, not using sufficient drug, second, careless manipulation in the preparation of the tincture. Considerable inquiry seems to clearly indicate the second cause as almost the only reason for this condition of affairs. The determining factor seems to be too much haste in preparation, caused by the stock on hand becoming short; another probable reason is that the pharmacists as a whole do not give as much personal attention to the preparation of galenicals as was the case in former years.

Powdered Cinchona.—Powdered cinchona of a quality far exceeding U. S. P. requirements is readily obtainable at a moderate price, yet the ordinary article is only 50 to 70 per cent. of the required alkaloidal strength; it is unnecessary to enter into discussion of the cause, it is self-evident. A possible cure is a shorter assay for the drug, if it is possible to devise one, even if it does not give absolute results.

Wines.—Although the U. S. P. recommends two excellent wines, namely, California Riesling and Ohio Catawba, from which to prepare the Vina,

yet the favorite article used extensively to-day is Sherry Wine, an article notoriously impure. I find pharmacists consider the preparations made by the latter as better; of course this is ambiguous, but I have failed to find any proof that the newer wines make better preparations; undoubtedly they are purer, but this does not prove that for medicinal purposes they are better, unless clinical evidence can be shown to this effect. It seems "C. P." is too frequently considered now-a-days as better medicinal evidence than reliable clinical reports.

Cleveland, O., July 27, 1897.

On motion of Mr. Hallberg, the paper was directed to take the usual course.

Mr. Good having been called to the chair, Mr. Alpers read a paper on "Aralia Nudicaulis."

ARALIA NUDICAULIS.

BY WILLIAM C. ALPERS AND BENJAMIN L. MURRAY.

Aralia nudicaulis grows abundantly in the New England and Middle States, extending north into Canada, south as far as North Carolina, and west to the Mississippi valley, selecting principally rich hilly woods. It is indigenous to the United States, not being mentioned in European text-books, and has a number of synonyms as wild licorice, shotbush, small spikenard, false sarsaparilla, Virginia sarsaparilla and wild sarsaparilla, the latter being the term more commonly used. While country people know this aromatic herb well under the name of wild sarsaparilla, or simply sarsaparilla, and use it "to purify the blood and cleanse the skin," it has attracted but little attention by the medical profession; its only use in medicine seems to be to serve as an adulterant of the official sarsaparilla, in several lots of which purchased in the New York market the writers have discovered it.

The late Professor Bastin examined Aralia nudicaulis microscopically, and published the results of his examinations in The Western Druggist, Vol. VII., 1885, page 314. This is the only literature that the writers were able to find on this interesting plant, and a chemical examination of its rhizome was probably never made before. There is a slight difference in the description of the leaves and the rhizome between Bastin's paper and ours, which suggests the idea that possibly the western species varies from the eastern, Bastin having collected his specimens in the vicinity of Chicago, while ours were gathered near New York. Bastin, for instance, says that the rhizome will reach a length of from three to five feet, and Gray in his text-books makes the same statement, while we have hardly found any rhizome shorter than five feet, and have a specimen here of 29 feet. The description of the leaves also shows some points of difference, the leaves of our specimens being more divided than the ones that Bastin describes. This latter observation was also made by Professor A. C.

Apgar, who proposed the name of Aralia Nudicaulis Prolifera (Bull. Torr. Bot. Cl., 14 : 166, 1887) for the species found in New Jersey, while Professor N. Britton, in his "Illustrated Flora," calls this kind "a mere form."

BOTANY.

Aralia nudicaulis belongs to the order Araliaceæ, and shares with the other members of the order the warm, aromatic, almost pungent, taste of some parts, principally the rhizome. Early in the spring a petiole and a scape grow near each other from the rhizome, which lies from one to four inches under the ground, and only rises occasionally a little above the soil. The straight petiole, swollen at the base, rises from eight to eighteen inches high and divides into three divisions, which at this point of divergence thicken like the base of the main petiole; each division bears a compound leaf of from three to five leaflets. Occasionally one of the lower leaflets is again compound. The leaflets are from two to five inches long, and from one to two and a half inches wide, pinnate with one terminal one, the lower pair on short petioles, the upper one mostly sessile, oblong-ovate, one of the lower ones occasionally almost round, acuminate, finely serrate, smooth on both surfaces. The scape is a few inches shorter than the petiole, and therefore, together with the flower or later the fruit, hidden under the spreading leaves. It has neither leaf nor bract, hence the name nudicaulis, and bears from three to seven small, simple umbels, each consisting of from five to twenty-five greenish flowers. Occasionally there are one or more odd flowers with rather long stalks growing at right angles out of the scape below or between the umbels. The flowers are perfect or polygamous, with both fertile and sterile ones on the same plant. The calyx is destitute of lobes or teeth; the petals, stamens and styles are five in number. During the summer a dark purple, nearly black, drupe develops about one-fourth of an inch in diameter. This fruit is probably a welcome food for birds, as it disappears soon after ripening and can only seldom be found on the ground under the leaves. It does not seem to serve for the propagation of the plant, the creeping root-stock performing this function.

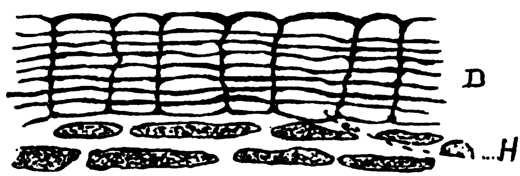
The most interesting part in which the peculiar aroma of the plant is best noticeable is the rhizome. It grows horizontally and spreads very quickly over a large area, reaching a length of more than 25 feet, branching abundantly and producing small hairy rootlets rather sparingly. The parts of the rhizome that rise out of the soil harden and afterwards die off, producing by their decadence two new growing plants in place of one. The rhizome is nearly cylindrical with many concave leaf-scars corresponding in shape to the swollen end of the petioles. The outer, very thin, grayish, somewhat glossy layer of the bark is easily detachable, and the lower, thick, fibrous layer can readily be peeled off the white or slightly yellowish wood, as long as the rhizome is fresh and moist. A white and

spongy pith forms the interior of the wood. On drying, the rhizome becomes wrinkled and brittle, and is from one-fourth to one-half inch in diameter. The taste of the fresh rhizome is peculiarly aromatic, similar to that of ginseng, leaving no bad after-taste.

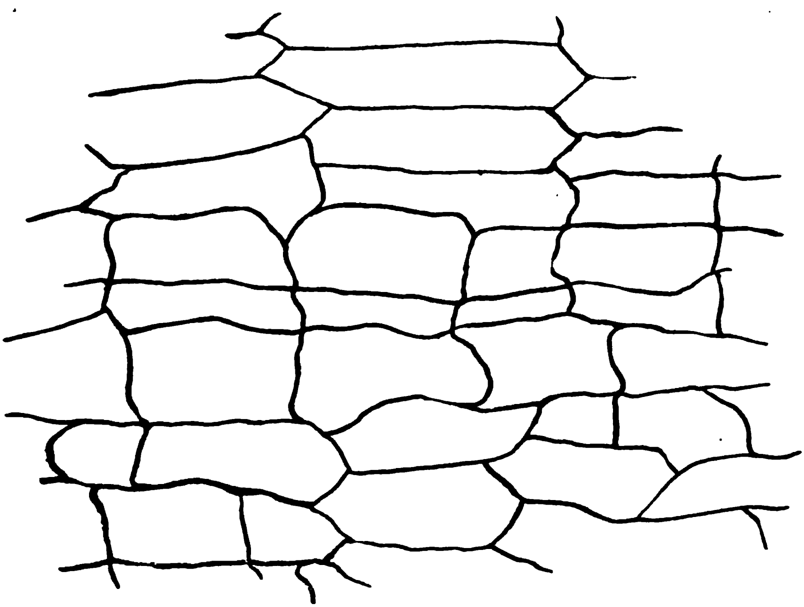
MICROSCOPY.

A cross section of a segment of the rhizome shows under the microscope three distinct parts, the pith, the wood and the bark. The pith consists of rather large granular cells, containing starch with occasional crystals of calcium oxalate.

The pith is surrounded by a wood zone which varies in thickness according to the age of the specimen. In old rhizomes the wood is about twice as thick as the bark, while in very young specimens a cross section shows a large pith, a thick bark, and very little wood.



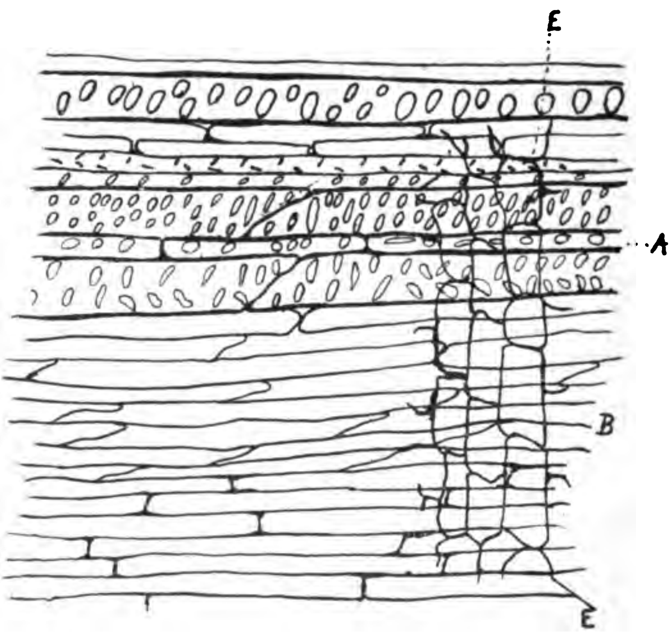
Corky layer of old bark; cross section.



Outer bark; longitudinal section.

The thick-walled woody wedges of irregular size are separated by medullary rays of one or two rows of cells. Sometimes these rays are prolonged into the bark. A layer of cambium cells in a double row surrounds the wood.

The bark consists of a fibrous layer, a corky layer, and an epidermis. The parenchyma cells are rich in starch and contain, like the pith, crystals of calcium oxalate. The characteristic part of the fibrous layer of the bark is the great number of oil or resin cells, the largest cells of the plant, resembling tubes that can often be traced quite a distance in longitudinal sections. They are intrenched by a wall of small cells that undoubtedly secrete oil and resin, while the large inner cells serve as reservoirs. The medullary rays often extend into this layer, taking an irregular, somewhat tortuous course, and sometimes their two rows of cells separate and encase one of these large oil cells. The resin is probably held in solution by the oil. Between the fibrous and corky layers of the bark, a double row of peculiarly shaped cells are observable, probably a layer of phellogen.



Wood ; from pith to bark ; longitudinal section.

The corky cells are empty and rather large, presenting no points of particular interest. A thin epidermis covers the corky layer, easily detachable and often wanting.

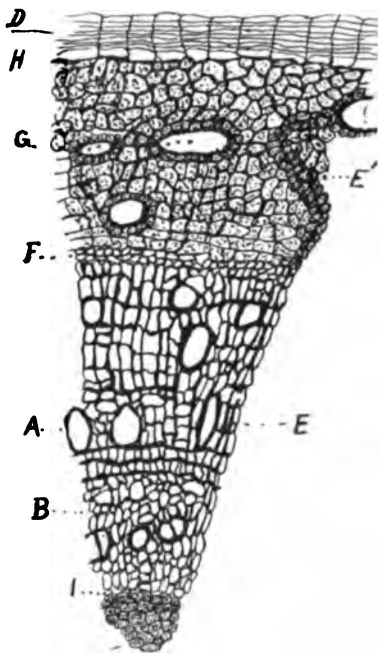
CHEMISTRY.

Samples of Aralia nudicaulis were gathered in the fall in the hilly woods in Bergen County, New Jersey, and most of the chemical examinations were made on these samples. A further supply was collected in the following spring, when the flowers of the plant were in bloom.

The general plan of the work was:

1. To determine the presence or absence of alkaloids or glucosides.
2. To determine the presence of other important constituents.
3. To undertake a systematic analysis and estimation of the constituents.

For the first part of the work, viz.: testing for alkaloids and glucosides samples of the drug gathered in the fall as well as in the spring were finely ground and digested for three days in a closely stoppered flask with Prollius' fluid. After filtering, the liquid was treated with acidulated water (sulphuric acid 1 part, water 5 parts) and the aqueous liquid submitted to examination. Wagner's reagent, tannin, picric acid, platinic chloride, sodium phospho-molybdate, and Mayer's reagent gave no precipitate. All



Entire rhizome; segment; cross section.

A pitted vessels; *B*, lignified cells; *D*, cork cells; *E*, medullary rays; *E'*, medullary rays, prolonged into bark; *F*, cambium layer; *G*, resin and oil cells; *H*, phellogen; *D* to *F*, bark; *F* to *I*, wood; *I* to *K*, pith.

the tests were repeatedly verified by using larger quantities of acidulous solutions.

For the further determination of important constituents, together with alkaloids and glucosides, the following experiments were made:

Large samples of the finely ground rhizome of Aralia nudicaulis, gathered both in spring and fall, were digested in benzene for three days. After filtering and evaporating to dryness, a yellowish-brown, resinous mass was obtained. This residue was treated with warm water, filtered and tested for alkaloids, glucosides and organic acids. The still insoluble residue was treated with acidulous water and this acidulous liquid tested as the preceding one. The reagents applied were salts of lead and calcium, tannic acid, Wagner's reagent, platinic chloride, gelatin solution and Fehling's solution. No reaction was obtained, except a slight change of color in Fehling's solution. To still further verify the above results and avoid the uncertain action of water upon the resinous matter, which became soft with heating, another benzene extract was made and treated directly with water and then with acidulated water. These aqueous solutions caused no new changes, the color of Fehling's solution alone being affected.

Tests for tannin were then made. A finely ground sample of the drug was digested with a good grade of absolute alcohol and the liquid filtered. This alcoholic liquid caused a slight reduction of Fehling's solution, and likewise precipitated a solution of gelatin, starch paste, and antimony and potassium tartrate. A solution of potassium hydrate was darkened, a solution of potassium permanganate reduced in about two minutes, solution of silver nitrate reduced, and a solution of ferric chloride rendered green. Confirmatory tests were made on two additional samples of the drug, in both cases with the same result. The same reagents were also applied to the alcohol alone, used for digesting, without showing any reaction. The presence of a small percentage of tannin was therefore determined.

The residue of the drug left in the experiment mentioned above, after treating the Aralia with absolute alcohol, was washed thoroughly with more absolute alcohol, dried, and then digested twenty-four hours in cold water. The aqueous liquid after filtration was of a brown color. Upon application of heat it reduced Fehling's solution and precipitated with a solution of basic acetate of lead, with a solution of borax, with alcohol and with ether. With a solution of ferric chloride in the cold it caused no precipitate. The presence of mucilaginous matter was thus shown.

As the next experiment a sample of coarsely cut Aralia nudicaulis was distilled with steam, the distillate showing the presence of an agreeable smelling volatile oil. The liquid comes over milky and oil globules soon collect floating upon the surface. The microscopical examination had already revealed that this oil resides in the bark of the rhizome, and, upon

distilling some of the fresh bark alone, without the wood and pith of the rhizome, quite appreciable quantities of oil were found.

Whether the rhizome gathered in the fall contains more or less volatile oil than the spring drug has not been determined; our impression, based on the odor and taste of the samples of various seasons is, however, that the oil is more abundant in the fall than in the spring. In working with the fresh bark alone the distillate became more milky and the oil drops solidified at about 20° C., showing a light yellow color. Further investigations of this oily portion led us to believe that some of the resins present in the plant were carried over in the distillation, though precautions were taken against it. The odor of the oil is persistent and gives the drug its characteristic smell, noticeable even in the air of places where the plant grows abundantly.

After having determined the absence of alkaloids and glucosides, and the presence of tannin, starch, volatile oil and resins in the rhizome of Aralia nudicaulis, examinations were made for some of the more important constituents according to Parson's scheme. At a temperature of 98° to 100° C., the drug lost 6.50 per cent. of moisture, and the dry sample, on which all future percentage calculations were based, contained on incineration, 5.47 per cent. of ash. This ash yielded 24.82 per cent., equal to 1.36 per cent. of the original dry sample, of soluble matter, consisting of chlorides and sulphates of sodium and potassium. The drug yields to chloroform 3.38 per cent. of a soft, brown, resinous and oily matter. This chloroformic extract was dried for two months over sulphuric acid without hardening. At a temperature of 110° C. it suffered a loss equal to 0.33 per cent. of the original dry drug, which amount represents the volatile oil present. Subsequent estimations of this oil were not successful.

After the treatment with chloroform, the residue was exhausted with 80 per cent. alcohol yielding 8.75 per cent. of brown resinous matter, of which 6.66 per cent. was ash. The portion of this alcoholic extract, soluble in absolute alcohol and again soluble in water, forming neutral solutions, gives tests with the following reagents for tannin: Basic acetate of lead—light yellowish precipitate; gelatin, starch, potassium and antimony tartrate—precipitates; potassium permanganate, silver nitrate—reductions; ferric chloride—green color. Further examination of this extract, omitting confusing details, shows the presence of acid resins and indications of neutral resins. An organic acid is also present.

After the chloroform and alcohol extractions, a water extract was made, equal to 3.58 per cent. of the dry drug, of which 24.36 per cent. was ash.

The next extraction, made with an acid menstruum of one part of sulphuric acid and five parts of water, yielded 56.10 per cent. with 11.67 per cent. of ash.

The final extraction, with an alkaline menstruum, yielded 6.89 per cent.

As a summary the following table is presented:

Extract with	Percentage of dry drug.	Containing
Chloroform	3.38	Resin 3.05 per cent., oil 0.33 per cent.
Alcohol 80 per cent.	8.75	Tannin; organic acid; acid resin (neutral resin?).
Water	3.58	Albuminous bodies; coloring matter.
Acid $\frac{1}{5}$, water $\frac{4}{5}$.....	56.10	Mucilaginous matter.
Alkaline solution ...	6.89	Crude fibres, etc.
(By subtraction)....	21.30	Cellulose.
	100.00	

Further investigation will be conducted, especially on the oil and resins in which the active medicinal properties seem to reside.

PHARMACEUTICAL PREPARATIONS.

A quantity of the fresh rhizome of Aralia nudicaulis, gathered in the fall, was digested with alcohol, according to the directions of the Pharmacopœia for making fresh tinctures. This tincture, Tinctura Araliæ Nudicaulis Recentis, after standing nearly a year, exposed to the varying temperatures of winter and summer, showed no precipitate, and possessed the odor and taste of the plant in a marked degree. Mixed with water it forms a milky precipitate indicating the presence of oil and resin. It has a beautiful gold-yellow color which seems to be permanent. A fluid extract was prepared from the rhizome gathered in the spring. A menstruum of four parts of alcohol and one of water was used, and the general directions of the Pharmacopœia for makingfluid extracts were followed. The evaporation of the second percolate was performed at a very low temperature, in order not to drive off oily or resinous parts. The fluid extract resembles the tincture, but is darker, owing to the solution of the coloring matter of the plant, and more aromatic.

Although this fluid extract appears to be an elegant and highly concentrated preparation, and to possess all the properties of the drug, it is doubtful, in the writers' minds, if therapeutically it would be the most desirable form of administering the drug. If the virtues of the drug depend, as we believe, on the oil and resins, the separation of these constituents, if possible, seems to be the most advisable step. The properties of the drug, judging from some crude experiments, seem to be stimulant, diaphoretic and probably neurotic.

It was moved by Mr. Hallberg that the paper be received and referred for publication. (Motion seconded and carried.)

Mr. Alpers having resumed the chair, the remaining papers were, on motion of Mr. Feil, read by title as follows:

Filing of Prescriptions, by W. C. Alpers.

Alkyl-bismuth Iodides, by A. B. Prescott.

Medicines of the Cree Indians of the North, by Chas. Flexon.

The Preparation of Fluid Extract of Wild Cherry for Syrup, by James M. Good.

Chemical Composition of Commercial Extract of Witch-hazel, by Joseph Feil.

The Important Constituents of Taraxacum Root, by L. E. Sayre.

The Preparation of Soluble Ferric Phosphate, by W. F. Puckner.

THE CHAIRMAN: We will now proceed to the election of officers for the ensuing year. A few nominations were made this morning, but nominations are still open. The nominations made this morning for Chairman were Edward Kremers, of Madison, Wis., and Wm. C. Alpers, of New York. I beg to withdraw my name in favor of Prof. Kremers, so there is only one name in nomination.

Upon motion of Mr. Ryan, duly seconded, the Secretary was instructed to cast the ballot for Mr. Edward Kremers as Chairman of the Section for the ensuing year, which duty having been performed, he was duly declared elected by the Chairman.

THE CHAIRMAN: Mr. Kauffman of Columbus was placed in nomination this morning for Secretary.

MR. KAUFFMAN: I want to say that I protested against this this morning, and I wish to repeat that protest now. It is simply impossible for me to do this work. I have held this position in former years, and I know it involves a large amount of work if properly cared for, and I don't want to take it unless I can take care of it properly.

MR. LLOYD: Mr. Chairman and gentlemen, I recognize that Prof. Kauffman has all that he can attend to as President of the Ohio State Pharmaceutical Association, and I hope you will accede to his request. I would nominate in his stead Dr. A. B. Lyons, for Secretary.

MR. SHEPPARD: Mr. Chairman, I second the nomination and move that nominations be closed.

Motion prevailed.

On motion of Mr. Werner, duly seconded, the Secretary was instructed to cast a ballot for Mr. A. B. Lyons, as Secretary of the Section; which duty having been performed he was declared elected by the Chairman. (Applause.)

MR. SADTLER: Mr. Chairman, you will have to put another man on the Research Committee, as Prof. Kremers has been elected Chairman of this Section, and by virtue of that office becomes ex-officio member of the Committee.

MR. GOOD: There is no reason why the Secretary should not be a member of the Research Committee, and I nominate Dr. Lyons.

MR. RYAN: I second the nomination.

On motion by Mr. Sadtler, duly seconded, the Secretary was requested to cast a ballot for Mr. A. B. Lyons as a member of the Research Com-

mittee. This duty having been performed by the Secretary, he was declared elected by the Chairman.

The Chairman announced as the next order of business the installation of officers, and appointed Messrs. Good and Caspari as the committee to conduct the new officers to the platform.

Mr. Kremers was conducted forward by the committee and introduced by Mr. Good to the Chairman, who in turn introduced him to the Section.

CHAIRMAN-ELECT KREMERS: I shall not detain you, gentlemen, by making any lengthy speech. Permit me to thank you for the honor you have conferred upon me. I feel that with the Secretary you have elected for this Section we shall try to do all we can to further the scientific interests of this Association, and naturally we shall have to rely largely upon the members of the Section. (Applause.)

Mr. Lyons was next conducted forward by the committee and introduced to the Chairman by Mr. Good.

THE CHAIRMAN: Gentlemen, permit me to introduce to you Dr. A. B. Lyons, whom possibly some of the older members of this Section know better than some of the newcomers. It has afforded me great pleasure to meet Dr. Lyons at this meeting, and no doubt you are all glad to welcome him back to the United States and to our Association (Applause.)

MR. LYONS: Gentlemen, do not expect me to make a speech on an occasion like this. I did rather expect when I came out here that I should be called upon to do some work for the Association. I feel that you have put me in a place where there is plenty of work, and I only fear that after a rest of nine years I shall fail you a little in doing my part of the work. (Applause.)

Upon motion of Mr. Werner, duly seconded, a rising vote of thanks was extended to the retiring officers.

On motion of Mr. Sheppard, duly seconded, it was voted that the Chairman be authorized to make such arrangements as he may deem expedient with the Chairman of the Committee of the Section on Education and Legislation for the reading of the papers that were read by title.

MR. MAYO: I move that the reading of the minutes of this session be dispensed with, and that we now adjourn.

The motion was seconded and prevailed, and the Section adjourned at 12:40 a. m.

PAPERS READ BY TITLE.*

* A few of these papers were read in detail at the final session of the Section on Education and Legislation, but no discussion occurred in connection therewith. The paper on Volatile Oils, by Edw. Kremers, and that on Standards for Linseed and White and Black Mustard Seed, by John U. Lloyd, were not ready in time to be printed with the rest, and if received later will be inserted at the end of the Report on the Progress of Pharmacy.—THE GENERAL SECRETARY.

THE CHEMISTRY OF CASCARA SAGRADA.

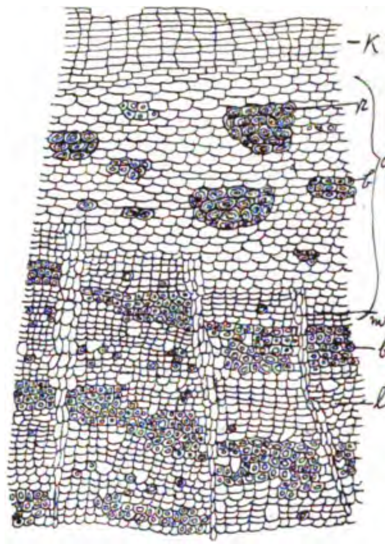
BY ALFRED R. L. DOHME, PH. D., AND HERMANN ENGELHARDT, PH. D.

The most generally used medicines are most probably laxative medicines, and the most generally used laxative medicine is most probably cascara sagrada bark. This is due to the remarkable property it possesses of being a tonic as well as a laxative, and in no less degree to the fact that its action is sure and comparatively free from any accompanying unpleasant effects. Most persons can use it regularly for years without it losing its virtues for their particular case. No drug in the pharmacist's armamentarium has sprung into such sudden prominence and has increased in general use to such an extent as cascara sagrada. Even conservative Europe, and especially conservative pharmaceutical Europe, has opened its arms and welcomed the "sacred bark" of the Pacific coast as a worthy companion of or possible successor to senna, aloes or rhubarb. The history of cascara sagrada has been told by Prof. J. U. Lloyd to this Association last year at Montreal, and we will not enter upon it here. Quite a number of publications upon the drug and its sister drug, buckthorn bark, have been sent us by the Chairman of the Special Committee of Research of the American Pharmaceutical Association, and we wish to express to him our thanks for the willingness with which he undertook to procure us copies of the various literature we needed for the work. Inasmuch as most of these publications and articles were upon the active principle of the drug and methods of isolating it, and most of them obtained varying results and different compounds, and none of them gave a complete analysis of the drug, we concluded to apply to cascara sagrada the systematic method of plant analysis suggested by Parsons and given in his book upon plant analysis, as well as in Prescott's organic analysis. The result of this proximate analysis of cascara sagrada we will hence give first, giving the detail of the work on the glucoside afterwards.

The cascara sagrada bark used in the investigation was a typical specimen with a light gray cork layer on the outside and a yellowish-brown cortical parenchyma layer on the inside. It was gathered in Oregon, and was somewhat less than one year old. It was in thin quills, and markedly bitter when chewed for a few minutes. It was powdered to a number eighty powder and then possessed in that form a yellowish-brown color. In cross section under the microscope it appeared as given in the accompanying sketch:

I. DETERMINATION OF MOISTURE.

Weighed quantities of the air-dried powder were carefully heated in an air-bath to 110° C. to constant weight, and as the mean of six determinations we found that it contained 8.3 per cent. of moisture. Its color was not perceptibly altered by the repeated heating at this temperature.



Cross Section of Cascara Sagrada Bark.

x, 100 diam.; *k*, cork cells; *cp*, cortical parenchyma; *r*, stone cells; *b*, bast fibers; *mr*, medullary rays; *l*, libriform.

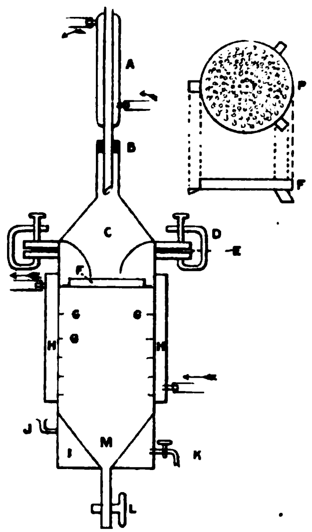
II. DETERMINATION OF ASH.

Weighed quantities of the air-dried powder were carefully incinerated in a platinum dish and finally heated to a bright red heat over a Bunsen burner to constant weight. As the mean of five determinations, the ash was found to represent 7 per cent. of the drug, the analysis varying between 6.9 and 7.05 per cent. as extremes. The bark is very difficult to incinerate, as it carbonizes very easily and then cakes, requiring repeated turning and long-continued heating to finally get it all reduced to a uniform gray color. A qualitative analysis of the ash showed the presence of sodium, potassium and aluminum, with traces of calcium and iron, together with silicic acid and traces of hydrochloric and sulphuric acids.

III. CHLOROFORM EXTRACT.

Although Parsons recommends the use of kerosene to extract the oils, wax, fat, etc., we found that chloroform answered fully as well. The drug was extracted for five hours in a specially devised apparatus which we constructed, and which is especially adapted to the extraction of large quantities of drug, and is more expeditious than the Soxhlet or Flückiger apparatus. The apparatus is given below.

To operate the apparatus, which is air-tight, charge all the plates, or as many as are needed, with powdered drug. Pour the menstruum into the apparatus through the condenser tube of *A*, until enough has been added



Drug Extraction Apparatus.

A is a Liebig's Condenser; *B* is a cork stopper closing head of apparatus *C*, and connecting the condenser with it; *C* is the head of the apparatus, which is round like a still and attached to the body of the same by a series of clamps *D* jointed by asbestos *E*; *F* are perforated tin plates containing drug and resting upon holders *G* on the inside of the apparatus; *H* is a jacket around the apparatus into which cold, warm or hot water can be let as wanted; *I* is similar jacket for bottom of apparatus with inlet *J* and outlet *K*; *L* is the stop-cock of the apparatus; *M* is funnel-shaped termination of the body of the apparatus, itself terminating in the stopcocked tube *L*; *P* is cross-section of one of the perforated plates, which have a round piece of filter paper over all the perforations, and the drug then placed on this.

to saturate all the drug and to fill the funnel *M* half full. Then apply a Bunsen burner to the jacket *I*, thus causing the menstruum here to evaporate and pass up through the apparatus and be condensed in *A* and drop back into the apparatus. If it is a volatile menstruum, the jacket *H* can be supplied with cold water to aid in its condensation; but if, on the other hand, the menstruum is vaporized with difficultly, warm or hot water can be passed into the jacket *H* to facilitate the volatilization of the same and prevent its recondensation before reaching the condenser *A*. After heating the jacket *I*, and continuing the extraction for half an hour or more, pass cold water into the jacket *I*, when all the menstruum in the apparatus will be drawn down into the funnel *M*, whence it can be drawn by the stop-cock *L*. Fresh menstruum is then added as before, and the process repeated until the extract drawn from the stop-cock is colorless.

Volatile Oil.

The result of the extraction with chloroform was a dark greenish-brown oil of a pronounced odor, reminding strongly of the drug. The yield was 7.5 per cent. of the air-dried drug. We supposed from the pronounced

odor that a volatile oil was contained in this extract, and were not mistaken in our conjecture, as we found upon treating the extract with steam that a yellowish green oil passed over with some of the chloroform. This oil was separated from the chloroform, in which it is soluble, with very great difficulty, and after redistillation in a vacuum was obtained comparatively pure but in very small quantity. It is extremely volatile, and possesses to a marked degree the characteristic odor of cascara sagrada bark, which hence in all probability derives its odor therefrom. Too little of it was obtained for an analysis, and efforts to saponify it proved fruitless on account of its volatility and the fact that when treated in a sealed tube with saponifying agents it was completely resinified.

Fixed Oil.

The oil remaining in the distilling flask after all the volatile products had been driven off by steam, was again heated with water, and the latter drawn off and tested for alkaloids with potassium mercuric iodide. As no precipitate was obtained, no alkaloids were extracted by the chloroform. Treatment of the aqueous solution with basic lead acetate gave no precipitate, showing absence of glucosides. It was then warmed slightly with dilute sulphuric acid to recover possibly present free alkaloids, but the effort resulted negatively also. It was then boiled with caustic potash to saponify the fixed oil, and after a short while it was entirely dissolved. After cooling the solution was extracted with ether, which left on evaporation a colorless oil. This oil soon became solid upon standing. It was recrystallized from alcohol and thus obtained in white leaflets melting at 24°–26° C. An analysis by combustion with copper oxide in a stream of oxygen, by the open tube method, gave the following results:

I. 0.107 Gm. substance gave 0.3024 Gm. of CO_2 and 0.172 Gm. of H_2O.
II. 0.1315 " " " 0.3715 " of CO_2 and 0.210 " of H_2O.

Calculated for $C_{12}H_{26}O$.	Found. I.	Found. II.
C = 77.42 per cent.	C = 77.07 per cent.	C = 77.2 per cent.
H = 13.98 per cent.	H = 14.4 per cent.	H = 14.5 per cent.

The substance is hence one of the numerous possible isomeric dodecyl alcohols, probably the normal dodecyl alcohol which melts at 24° C. It was found to be quite a difficult matter to separate and obtain pure the two fatty acids which are combined with the above dodecyl alcohol to make up the fixed oil of Cascara Sagrada. However, we believe our reresults hardly leave any doubt as to their identity. To obtain them, the alkaline liquid, which has been extracted with ether to obtain the above alcohol, was heated to remove all the ether and then treated with hydrochloric acid, which precipitated an oil. This oil soon became solid and was then found to melt at 30° C, although all efforts to purify it by crystallization

from alcohol proved futile. The potassium salt of the acids was hence prepared by dissolving the substance in caustic potash and then purified by fractional crystallization from alcohol. As obtained therefrom, it crystallized in pearly leaflets and the acid obtained from it melted at 57° C. An analysis of the acid potassium salt showed it to be a mixture of stearic and palmitic acids. The neutral potassium salt was of course obtained when the fatty oil was saponified by means of caustic potash, but on treating this with alcohol or water it is converted into the acid salt. The analyses follow:

0.211 gramme substance were incinerated and heated to constant weight with sulphuric acid and gave 0.032 gramme of K_2SO_4.

0.178 gramme, similarly treated, yielded 0.027 gramme K_2SO_4.

		Found.	
		I.	II.
Calculated for acid potassium palmitate	K = 7.09 %.		
Calculated for acid potassium stearate.	K = 6.43 %.	K = 6.8 %.	K = 6.9 %.

The analyses would indicate that the salt obtained was most likely acid potassium palmitate, but the melting point of the free acid at 57° C., which is below that of palmitic acid, 69.2° C., and that of stearic acid, 62° C., indicates that it is very likely a mixture of both, as a mixture of several substances nearly always tends to lower the melting point of either. The conclusion reached is then that the fixed oil of cascara sagrada is a mixture of dodecyl palmitate and dodecyl stearate, and we regret that we were unable to definitely settle this point, and hope to be able to do so during the course of the coming autumn.

IV. EXTRACT WITH 80 PER CENT. ALCOHOL.

The residue from the chloroform extract, which had assumed a slightly darker color after being dried, was extracted for twelve hours with eighty per cent. alcohol. The menstruum extracted twenty-seven per cent. of the original air-dried powder. After distilling off the alcohol, there remained a brown, rather hard residue, possessing the characteristic bitter taste of Cascara Sagrada. It was boiled for half an hour with absolute alcohol, which dissolved the greater portion of it. The solution obtained in absolute alcohol was heated until all the alcohol had passed off, and then extracted with warm water and the aqueous solution treated with basic lead acetate. The result was a reddish-brown precipitate, which we believe consisted of a mixture of the lead salt of the glucoside with the lead salts of the tannates present, inasmuch as the precipitate formed by treating the pure glucoside with the same reagent is brick-red in color. It was filtered off and stirred up with water while hydrogen sulphide was passed through to remove all the lead. The lead sulphide was filtered off and the filtrate evaporated to dryness, resulting in a brown amorphous residue

which is soluble in alcohol, acetone and ethyl acetate. Recrystallized from any of these it forms fine dark brown needles, but only in small quantities, the majority separating out again in an amorphous condition. This is the glucoside of Cascara Sagrada which we have named purshianin, analogously to the glucoside frangulin obtained from rhamnus frangula. That portion of the residue from the 80 per cent. alcohol extract found to be insoluble in absolute alcohol was treated with hot water and the resulting solution treated similarly with basic lead acetate. The result was a dirty yellow precipitate which, after removal of the lead, gave a dark brown resinous substance, different in color from that obtained from the portion soluble in absolute alcohol. We will enter into the details of the work on these glucosides later.

V. HOT WATER EXTRACT.

The residue from the absolute alcohol extraction, which had now assumed a dark-brown color and was practically devoid of taste, was macerated for twelve hours with water and then filtered. The aqueous extract was evaporated to dryness and found to represent about 12.3 per cent. of the weight of the original air-dried drug. It had a dark brown color and was devoid of any taste. The residue from this aqueous extract was boiled with dilute sulphuric acid (1 : 100) to invert all starches present, and the residue filtered off and dried. The amount of the starches, sugar, etc., so extracted was not determined, but will appear in the final résumé of the analysis as difference after everything else has been determined.

VI. DILUTE ALKALI EXTRACT.

The dried residue from the hot water extraction was treated with half per cent. caustic potash solution, which extracted 21.3 per cent. of the original powder, including most all of the remaining coloring matter. The residue from this extraction was treated with calcium hypochlorite to bleach it, and then yielded 16.1 per cent. of practically white cellulose.

Summed up, htese analyses show that Cascara Sagrada is made up as follows:

I. Moisture	8.3	per cent.
II. Soluble in chloroform	7.5	"
III. Soluble in 80 per cent. alcohol	27.5	"
IV. Soluble in hot water	12.3	"
V. Soluble in dilute alkali	21.3	"
VI. Cellulose	16.1	"
VII. By difference, starch, etc	7.0	"
	100.0	per cent.

THE GLUCOSIDES OF CASCARA SAGRADA.

We next desire to speak in detail of the work we have done upon the glucosides of Cascara Sagrada. The literature on the glucosides of buck-

thorn and Cascara Sagrada is quite extensive, and we will give a general account of what has been done upon them by other investigators. Buckthorn bark (Rhamnus frangula) had been investigated quite considerably before Cascara Sagrada was known and studied. Casselmann * and later Enz † worked on buckthorn bark and obtained therefrom citron-yellow silky crystals which were tasteless and odorless and melted at 226° C. Their composition was for a long time a matter of dispute among chemists, Hesse ‡ claiming that the formula was $C_{20}H_{20}O_{10}$ which was also verified by Faust; but Casselmann set up the formula $C_6H_6O_3$ as the result of his analyses. Faust then decomposed the substance by treating it with alcoholic hydrochloric acid and discovered that it was a glucoside, as it yielded him sugar and an acid which he named frangulinic acid. This he obtained in golden yellow crystals melting at 248–250° C., difficultly soluble in water, chloroform and benzene, but easily soluble in ether and alcohol, as well as in alkalies, in which latter it dissolved with formation of a purple-red color. Later investigations showed that this frangulinic acid was the same as emodin which is tri-oxy-methyl anthraquinone. According to Baeumker § it is quite an active laxative. Thorpe and Robinson ‖ and Thorpe and Miller ¶ went into the matter more closely and determined that the glucoside had the formula $C_{21}H_{22}O_9$ and was split up by acids into emodin and a dextro-rotatory sugar, which is not glucose however, but was identified by them as rhamnose. Schwabe's ** work on Cascara Sagrada is quite extensive, and he concluded that the active principle is emodin which melts at 254° C., and whose formula he determined to be $C_{15}H_{10}O_5 + H_2O$. The cascarin of Le Prince †† is certainly not a pure substance, to judge by the description given.

Summed up, the work done indicates that buckthorn bark contains a glucoside frangulin and that this is split up into emodin, which is tri-oxy-methyl authraquinone, and a sugar, rhamnose or isodulcite, and further, that Cascara Sagrada contains emodin but not frangulin. We proceeded as follows in obtaining the glucoside of Cascara Sagrada which had, up to the time of our work, not been obtained. The drug was extracted with chloroform to remove fats, etc., and the residue extracted with 80 per cent. alcohol, and the resulting extract dried and dissolved in hot water. On cooling, some resinous, waxy substance separated and was filtered off. The filtrate was treated with lead acetate, which produced a yellow precipitate.

* Casselmann, Annalen der Chemie, 104, p. 77.

† Enz, Vierteljahresschrift der Praktischen Pharmacie, 16, p. 106.

‡ Hesse, Annalen der Chemie, 117, p. 349.

§ Baeumker, Exper. Beitr. zur Kenntniss der pharm. Wirkung von Frangulasäure, Göttingen, 1880.

‖ Thorpe and Robinson, Journal Chem. Society, 57, p. 38.

¶ Thorpe and Miller, *ibid.*, 61, p. 1.

** Schwabe, Archiv. der Pharmacie, 226, p. 569.

†† Le Prince, Compt. Rend., 115, p. 286.

This was filtered off and stirred with hot water on a water bath. As the lead tannates are difficultly decomposable by H_2S it is advisable to pass this gas through the suspended precipitate of lead salts at a temperature of about 100° C. This was done until on shaking the flask, whose mouth was closed by the thumb, the latter was raised by the pressure of the gas. The PbS. was filtered off and the filtrate evaporated to dryness, resulting in a dark brown substance which consisted mainly of tannins, as portions of them dissolved in water gave good inks on treatment with ferric salts. This tannate mass appears to be composed of several tannins which we did not undertake to investigate, reserving that for a later time, should Prof. Trimble not find time to undertake the same. The filtrate from the lead tannin was treated with basic lead acetate and gave a dark red-brown precipitate of lead glucosides. It is not by any means pure, or it would be colored more nearly cinnabar-red. The precipitate is stirred with hot water in a flask and treated with hydrogen sulphide as before. The filtrate from the lead sulphide on evaporation yields a hard, brown-red substance which is very difficult to obtain in a crystalline form, as efforts to crystallize it from acetone and ethyl acetate resulted only in our obtaining a few dark brown-red needles melting at 237° C., the most of it separating out in an amorphous condition. Not sufficient of it was obtained to make an analysis, but we could confirm that it was not emodin, as it gave no purple color on being treated with caustic potash. It is the glucoside of Cascara Sagrada which has so far eluded capture, and we have named it purshianin as already explained, being analogous to the frangulin of buckthorn bark. On heating it with alcoholic hydrochloric acid we obtained a sugar and a product which proved to be emodin. The product obtained by heating the purshianin with alcoholic hydrochloric acid was poured into cold water, when a yellow crystalline substance separated out. This was recrystallized from ethyl acytate, which proved the best solvent for the purpose, and separated therefrom in reddish-yellow needles melting at 254° C. (one lot melted at 256° C.) and producing a blood-red color on treatment with caustic alkalies. The crystals were dried at 110° C. and appeared to lose some moisture during the process, which was not, however, determined. The analysis of these reddish-yellow needles, dried at 100° C., resulted as follows:

I. 0.257 gramme gave 0.6304 gramme CO_2 and 0.0972 gramme H_2O, or 66.9 per cent. C and 4.2 per cent. H.

II. 0.091 gramme gave 0.02330 gramme CO_2 and 0.032 gramme H_2O, or 66.83 per cent. C and 3.9 per cent. H.

		Found.	
		I.	II.
Calculated for $C_{15}H_{10}O_5$—	C = 66.6	C = 66.9	C = 66.83
	H = 3.7	H = 4.2	H = 3.9

These figures, together with the melting point 254° C., leave little doubt but that the substance in hand was emodin, which has also been found to be the active principle of buckthorn bark and likely in a measure of rhubarb. The sugar that is formed when purshianin is saponified appears to be dextro-rotatory and non-fermentable, but we have not yet examined it with sufficient care to arrive at a definite conclusion as to what it is. It will be necessary to obtain a quantity of it, make its osazone, and endeavor to recognize it by the properties and analysis thereof. It appears that the glucoside purshianin is certainly one of the active principles of the drug as in doses of one-fifth of a grain it produces the effects of the drug as far as these affect the bowels. Purshianin is tasteless and odorless, and soluble in alcohol, ethyl acetate, acetone, alkalies and hot water. We wish to reserve for ourselves its further study, which we hope will bring to light wherein the difference between frangulin and purshianin lies. Frangulin is an orange-yellow powder melting at 225° C., according to Thorpe and Robinson, while we find that purshianin is a dark brown-red crystalline substance melting at 237° C. Curiously enough, both are glucosides and yield the same substance on being saponified, viz., emodin. The difference cannot hence lie in anything but the sugars that are combined with the emodin to form the glucosides, or perhaps in the way in which these are combined. A fact it is, nevertheless, and notwithstanding the above apparent marked similarity, that Cascara Sagrada acts more agreeably and effectively than buckthorn bark, which it has practically supplanted. It may be possible that both of these drugs do actually contain as their active principle the identical glucoside, and that the cascara either contains more of it or produces a happier result on the patient by virtue of its other accompanying constituents. We hope to be able to solve this question this autumn, and also to isolate the bitter principle of the bark and determine in what way magnesia or lime removes or alters the same so as to render the preparation free from bitterness.

Baltimore, August 1, 1897.

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COMPARATIVE STRUCTURE OF THE LEAVES OF DATURA STRAMONIUM, ATROPA BELLADONNA AND HYOSCYAMUS NIGER.

BY J. O. SCHLOTTERBECK, PH. D., AND A. VAN ZWALUWENBURG, PH. C.

This comparison was undertaken to determine once and for all the most characteristic features of these three leaves, in their finer structure, with a view to their identification when in the form of a fine powder. There still seems to be considerable confusion concerning the comparative structure of these three related leaves. Just recently an article upon the minute anatomy of one of these leaves omitted entirely the most important feature ; a characteristic that renders its identification comparatively easy, even when in the condition of a fine powder.

It was also considered desirable to determine in these three leaves whether certain accepted characteristics are constant properties or whether they may be modified by varying agricultural conditions. The crystal pockets in the mesophyl of the leaf of A. Belladonna are almost universally stated to be filled with minute crystals of calcium oxalate, looking like sand, and hence called crystal-sand. Our investigations show that these pockets are by no means seldom filled with bundles of raphides. Also the crystals which occur in the leaf of D. Stramonium are often cubical, instead of stellate, as is generally stated.

In the following descriptions the aim has been to mention all important structures and to emphasize the features most peculiar to each leaf.

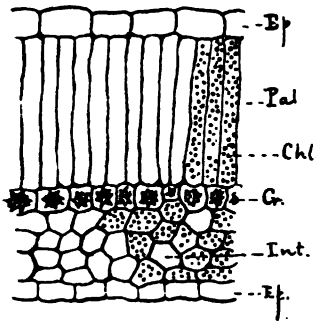
DATURA STRAMONIUM.

The leaves are described as five or six inches long: petiolate, smooth, pointed, triangular ovate, irregularly sinuate, toothed at the margin, unequal at the base, dark-green on the upper surface, pale beneath. Margins not hirsute and midrib very prominent. They contain frequent round perforations said to be caused by the breaking out of corky excresences. The dry leaves are thin and brittle, nearly inodorous, taste unpleasant, bitter and nauseous.

In cross-section (Fig. 1, *Ep.*) the epidermal cells of the upper are similar to those of the lower surface—large and oblong, averaging in thick-

ness about one-half of their apparent length. The palisade-cells take up fully one-half of the thickness of the leaf. They are long, narrow, very thin-walled cells, closely packed, and have a more or less undulating outline; in length from 6 to 8 times their thickness (Fig. 1, *Pal.*).

FIG. 1.



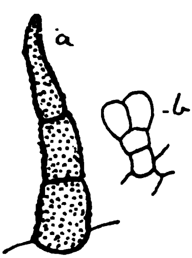
Transverse Section of the Leaf of Datura Stramonium.

Ep. Epidermis; *Pal.* Palisade cells; *Chl.* Chloroplasts; *Cr.* Crystals; *Int.* Intercellular spaces.

Immediately below the palisade-cells are the crystal-cells or crystal-pockets (Fig. 1, *Cr.*). In a cross-section they form an almost unbroken line parallel with the surface of the leaf and lying between the palisade-cells and the mesophyl proper. In appearance they differ little from the ordinary thin-walled cell of the mesophyl, but they bear in their center the very characteristic stellate crystals of calcium oxalate, one in each cell. These crystals appear to be made up of a mass of smaller cubical crystals, or rather twin-crystals of the cubical system. Sometimes, especially in some other species of Datura, these stellate crystals are replaced by one single cube. In very fine powder these crystals are usually much broken up, and care must be taken not to mistake a fragment of one of these cubes for a prism from the leaf of Hyoscyamus niger.

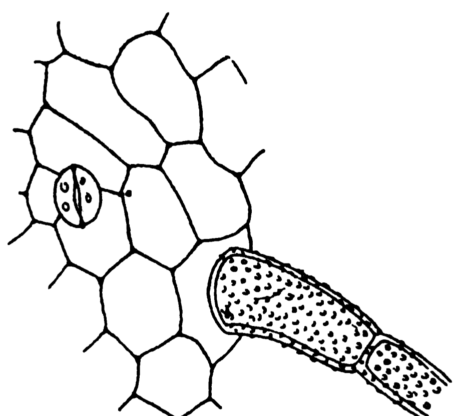
Stramonium leaf bears two kinds of leaf appendages: A thick-walled,

FIG. 2.



Epidermal Appendages.

FIG. 3.



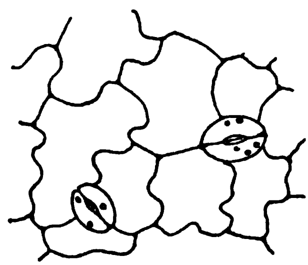
Upper Epidermis.

usually two or three-celled simple hair, rough from many little warty excrescences upon the exterior of the cell-wall (Fig. 2, *a*). This hair is

quite characteristic, and portions of it may be found in very finely-powdered leaf. The other form of leaf appendage is what appears to be a two or four-celled globular gland attached to the epidermis by a short stalk, very dark with contained coloring matter (Fig. 2, *b*.). Both forms are more abundant in the region of the midrib.

In tangential section the upper epidermal cells appear more angular than those of the lower side, whose side-walls have the undulating form seen in the lower epidermis of many leaves. The stomata of both sides of the leaf are perfectly elliptical in form, and contain, as is usually the case, several chloroplasts (Figs. 3 and 4).

FIG. 4.



Lower Epidermis.

In the powder the characteristic most readily observed is the crystalline form of the calcium oxalate. Of these there is always an abundance, and in the finest powder it is always possible to find some that are intact. Many of the crystals will, however, be broken, when their identification becomes more difficult. Clumps of palisade-cells may also be found, and are easily distinguished from those of A. Belladonna and Hyoscyamus niger by their length and their undulating outline. Portions of the hairs can always be found, and the thick walls and warty appearance of the simple forms are of great value for identification.

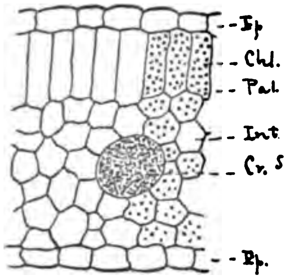
ATROPA BELLADONNA.

Leaves from four to six inches long, broadly ovate, narrowed into a petiole, tapering at the apex, entire on the margin, smooth, thin, the upper surface brownish-green, the lower surface greyish-green, having a slight odor and a bitterish, disagreeable taste.

In cross section the epidermal cells are similar to those described under D. Stramonium (Figs. 5 and 6, *Ep.*). The palisade cells, however, are different, being much shorter and thicker and often less closely packed. Their thickness is about one third their length. Embedded in the soft tissue of the mesophyl is an interrupted and irregular row of very large, round crystal pockets. (Figs 5 and 6, *Cr. S.* and *Ra.*) These cells and their contents furnish a feature so distinguishing as to be alone suf-

ficient for identification. The pockets are completely filled with calcium oxalate crystals, either in the form of crystal sand or as a mass of fine acicular crystals. Crystal sand is probably the most common form. It is

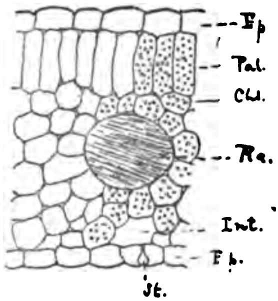
FIG. 5.



Transverse Section of the Leaf of Atropa Belladonna.

Ep. Epidermis; *Chl.* Chloroplasts; *Pal.* Palisade cells; *Int.* Intercellular spaces; *Cr. S.* Crystal sand.

FIG. 6.



Transverse Section of the Leaf of Atropa Belladonna.

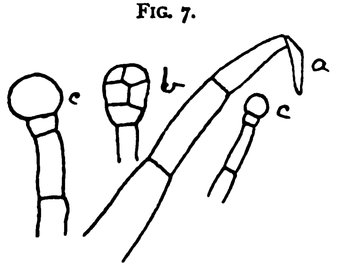
Ep. Epidermis; *Pal.* Palisade Cells: *Chl.* Chloroplasts; *Ra.* Raphides; *Int.* Intercellular spaces; *St.* Stoma.

not at all likely that both forms occur in the same plant, at least we have never found it so. In fine powder many of these cells are broken open and their contents scattered.

Belladonna leaves have three kinds of epidermal appendages. Large, simple hairs composed of several large, very thin-walled cells (Fig. 7, *a*), short, glandular hairs, the head of which is several-celled (Fig. 7, *b*), and long hairs similar to the first, but tipped with a one or more celled gland (Fig. 7, *c*).

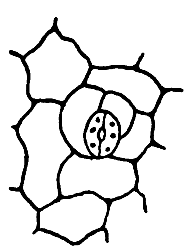
In the tangential section the upper epidermal cells are somewhat more angular than the undulating-walled cells of the lower side, otherwise they are much the same (Figs. 8 and 9). In old, dry leaves they are often

FIG. 7.



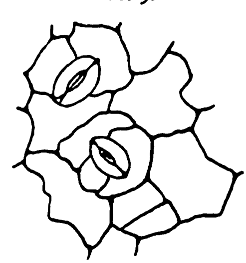
Epidermal Appendages.

FIG. 8.



Upper Epidermis.

FIG. 9.



Lower Epidermis.

covered with fine, wavy, parallel lines, apparently wrinkles of the cuticle. The stomata are large and regular and contain chlorophyl.

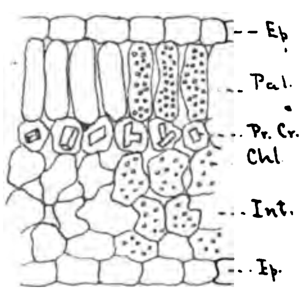
The powder, if not too fine, will contain some of the crystal-cells intact. Many will be broken. If the powder is fine enough to disintegrate all of these cells, identification will be very difficult, if not impossible. The epidermal appendages are still more fragile than the crystal-cells, and have no features distinctly characteristic of Belladonna. All of the different forms of leaf-cells can be recognized in the powder, the epidermal-cells especially, but none of them possess value for identification at all comparable with that of the crystal-cells. How fine a powder can be recognized will depend upon how fine the leaf can be powdered without breaking up these crystal-cells. Parts of the flower and seed frequently occur in powdered belladonna leaf. Pollen grains are also often present in large numbers.

HYOSCYAMUS NIGER.

Leaves large, oblong, ovate, deeply sinuated with pointed segments, undulated, soft to the touch, and at their base usually embracing the stem. The upper leaves are generally entire. Both the stem and leaves are hairy, viscid because of a glandular secretion, and of a sea-green color.

In cross section, the epidermal-cells are thin-walled, and in appearance much as those of A. Belladonna and D. Stramonium (Fig. 10, *Ep.*). The palisade-cells are in size and shape similar to those of A. Belladonna leaf, but very different from those of Stramonium. They are loosely packed, and are in length about three times their width (Fig. 10, *Pal.*). Below

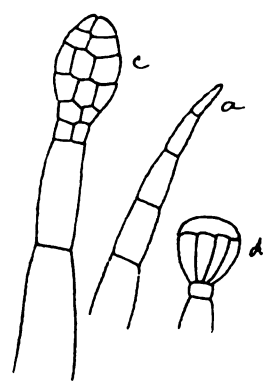
FIG. 10.



Transverse Section of the Leaf of Hyoscyamus Niger.

Ep. Epidermis; *Pal.* Palisade cells; *Pr. Cr.* Prismatic crystals; *Chl.* Chloroplasts; *Int.* Intercellular spaces.

FIG. 11.



Epidermal Appendages.

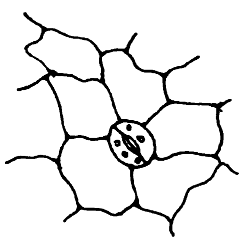
them, about midway between the upper and lower surface of the leaf, are the crystal-cells, which occupy a more or less straight row. (Fig. 10. *Pr. Cr.*). These contain almost invariably a single prismatic crystal or a twin-crystal. This crystal occupies the center of the cell, and is comparatively small, smaller than those of D. Stramonium. These crystals form the most characteristic feature in the minuter structure of the leaf.

The epidermal appendages of H. niger are of four kinds; two quite plentiful and one more difficult to observe. Long, simple, thin-walled hairs (Fig. 11, *a*); short glandular hairs with head consisting of one cell; long hairs tipped with a many-celled, glandular head (Fig. 11, *c*); and a short-stalked, many-celled glandular hair, whose secreting cells assume the form of a rosette (Fig. 11, *d*).

All of these forms are difficult to find in powdered hyocyamus leaf, and are easily mistaken for similar forms occurring in belladonna and stramonium leaf.

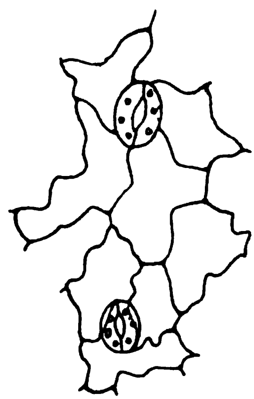
In tangential section both the upper and lower epidermis, as well as the stomata, are so similar to those of Belladonna that they are of little if any value for comparison (Figs. 12 and 13).

FIG. 12.



Upper Epidermis.

FIG. 13.



Lower Epidermis.

In powdered leaf the prismatic crystals are very plentiful, though hard to find in place in their cells. Seen endwise, they may appear square, like the crystals sometimes seen in Stramonium powder, but there are many presenting a side to the observer, and they will appear oblong. By focusing in the microscope up and down, it is easy to distinguish them from the oblong fragments of cubes occasionally seen in powdered Stramonium.

RESUMÉ OF CHARACTERISTICS.

D. Stramonium.	*A. Belladonna.*	*Hyoscyamus niger.*
Leaf.—Smooth, sinuate, unequal at the base; with round perforations and prominent midrib underneath.	*Leaf.*—Broadly ovate, narrowed into a petiole, entire margin smooth.	*Leaf.*—Hirsute, deeply sinuous, clasping at the base.
Powder.—Elongated palisade-cells. Stellate crystals predominating, occasionally cubes. Thick-walled, warty hairs.	*Powder.*—Crystal-cells large, round and full of crystal sand or acicular crystals.	*Powder.*—Crystals prismatic, or in twin forms. Seldom, if ever, stellate.

In our observations we have never noticed any deviation in the form of the calcium oxalate crystals which are so characteristic for each leaf. Belladonna would appear to be an exception, since we have here crystal-sand and raphides.

In examining the unbroken dried leaves it is easy to distinguish between the three by the shape and margin of the leaf. If very brittle, they can be soaked in 50 per cent. alcohol, and then spread out.

In cutting sections for examination under the microscope, the leaves should be soaked first in 50 per cent. alcohol and then transferred to alcohol of 96 per cent. The mounts are very satisfactorily made in a solution of chloral hydrate, which acts as a clearing fluid.

The dry powder should be mounted directly in the chloral hydrate solution without previous soaking.

ALKYL BISMUTH IODIDES AND BISMUTH IODIDES OF VEGETABLE BASES.

BY ALBERT B. PRESCOTT.

The common alkyl ammonium iodides, with solutions of the bismuth salts, give bright-colored precipitates. As formed by quaternary methyl or ethyl ammonium iodides the color is orange-yellow in most cases, usually lighter when obtained with bismuth chloride, darker when obtained with bismuth nitrate. When fully formed by excess of the organic iodide, in bismuth solution not strongly acid, the precipitation is amorphous and so nearly complete that when the filtrate from a test-tube portion is evaporated to dryness and the residue ignited and treated with solvent acid, hydrogen sulphide fails to blacken the liquid. Strong mineral acids slowly decompose these colored precipitates, liberating iodine.

What has been known as Dragendorff's reagent for alkaloids is a potassium bismuth iodide, prepared by dissolving precipitated bismuth iodide in a concentrated solution of potassium iodide acidulated with hydrochloric acid, and known as giving reddish-colored precipitates in solutions of the salts of the alkaloids. On trial with pyridine salts, a corresponding

precipitate was obtained, dark orange-red and voluminous. Kraut * has reported the piperidine compound, to which all these are analagous.

These organic bismuth iodides are not perfectly proof against decomposition by much water; they are sparingly soluble in ethyl or amyl alcohol, insoluble in glacial acetic acid, in ethyl ether, in chloroform, and in benzene.

The tetramethyl ammonium bismuth iodide crystallizes from hydrochloric acid, that of sp. gr. 1.19 diluted with an equal measure of water. Also from potassium iodide solution acidulated with hydrochloric acid. The pyridine and the alkaloid bismuth iodides crystallize from alcohol. In all these cases the crystals are clearly hexagonal and easily obtained.

Both the amorphous and crystalline forms are stable in the air. A sample of tetramethyl ammonium bismuth iodide remained constant in weight at 130°; atropine bismuth iodide melts, but at 98° C. holds constant weight.

Reducing agents, as potassium thiosulphate, do not alter these bismuth iodides. Tetramethyl-ammonium-bismuth iodide, precipitated from 10 per cent. solutions both of the organic iodide and bismuth iodide, washed with hydrochloric acidulated water, then with pure water till washings gave no residue, then with alcohol, and lastly with ether, and dried at 110°, gave figures as follows:

Analyses I. and II. were of the same preparation, III. and IV. from other preparations made at different times.

	I.	II.	III.	IV.	$N_3(CH_3)_{11}HBi_2I_7$.
Iodine...	58.71	58.29	60.79	....	59.22
Bismuth .	27.08	....	....	....	27.07
Carbon ..	8.69	8.68	8.58	8.06	8.82
Hydrogen	2.16	2.12	2.30	2.37	2.08
Nitrogen .	2.81	2.73	....	....	2.81

The pyridine bismuth iodide, prepared from a pyridine salt by Dragendorff's reagent and crystallized from alcohol, on elementary analysis gave figures as follows:

Different preparations.	I.	II.	III.	$(C_5H_5N)_3(HI)_3Bi_2I_6$.
Iodine...............	63.98	62.84	62.24	63.59
Bismuth..............	23.36	23.72	....	23.18

Kraut (Ann. 210, pp. 310–327) found analogous composition for piperidine bismuth iodide.

The corresponding atropine bismuth iodide gave results as follows:

Several preparations.	I.	II.	III.	$(C_{17}H_{23}NO_3)_3$-$(HI)_3Bi_2I_6$.
Iodine	46.99	47.03	46.51	46.96
Bismuth.............	18.82	18.67	18.53	17.22
Carbon	23.22	23.62	23.69	25.23
Hydrogen	2.87	3.02	2.94	2.96
Oxygen	8.10	7.66	8.33	7.63

* Ann. Chem. (Liebig) 210, pp. 310–327.

The carbon is too low for the theory, so that the figures approach to those of $(C_{17}H_{28}NO_3)(HI)BiI_3$.

The brucine compound gave, for $(C_{23}H_{26}N_2O_4)_2(HI)_2Bi_2I_6$, for iodine 41.10 and 40.88 per cent. against 41.56 by calculation from the formula.

The corresponding strychnine salt gave, for iodine, 44.02 and 44.65 per cent. against 44.48 by calculation from the formula.

In the results of the work I have done upon the perhalides and double halides of nitrogen bases in the last two or three years, everything goes to support the theory that two or more halogen atoms link to each other with an (uneven) valence of more than one, so as to connect one group of atoms with another. Iodine especially among the halogens serves as a binding element in the coupling of molecules or groups with each other, as well as in massing many iodine atoms together in a heavy periodide, as a swarm of bees hangs upon the bough of a tree. In the double iodide structure, where iodine links one base to another base, serving between positive and positive, with iodide not in excess of the "normal" number of its atoms, potassium thiosulphate will not take iodine out of the compound. In the periodide structure where iodine links a base to additive iodine, serving between a positive and a negative group, potassium thiosulphate promptly removes all the additive iodine, leaving a normal single iodide. These generalizations apply to the dipyridine alkyl iodides reported with determination of molecular weight by Mr. Flintermann and myself in 1895.* Also to the various monopyridine alkyl normal iodides † and to the numerous periodides.‡ In the compounds of additive iodine, as in double iodides, the results of analysis are in most cases consistent with an uneven valence of iodine, indeed with its trivalence. But there are a very few periodides well determined by Mr. Trowbridge as monopyridine compounds, in which in our present knowledge an even numerical valence of iodine is indicated.

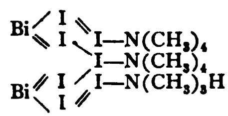
The bismuth iodides of nitrogen bases reported in this paper, both those of fatty alkyls on the one hand and those on the other hand of pyridine and pyridine-derived alkaloids, all evidently conform in their analytical content to the regular iodine-linking structure, the structure common both to double iodides and periodides as shown in the following proposed constitutional formulæ. In the case of the quaternary ammonium bismuth compounds, with the prevailing bismuth characteristic of losing halogen in presence of water, the wash-water being found tinged with iodine, each bismuth atom is directly bound to only two atoms of iodine, while in the pyridine-formed compounds the bismuth atom is bound to three atoms of iodine in each instance, bismuth and iodine valencies being always the

* J. Am. Chem. Soc. 18, p. 28.

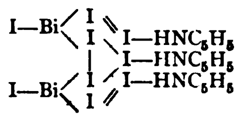
† Prescott and Baer, 1896; J. Am. Chem. Soc. 18, p. 247.

‡ Prescott and Trowbridge, 1895: J. Am. Chem. Soc. 17, p. 859; P. F. Trowbridge, 1897: J. Am. Chem. Soc. 19, p. 322; Trowbridge and Diehl, 1897: J. Am. Chem. Soc. 19, p. 558.

same. Again, the fatty ammonium compounds, less stable as they are, show a variation from the quaternary to the tertiary base type, in one of the three nitrogen basal groups of the molecule. This doubtless comes about by reaction of water to form methyl alcohol as by-product, leaving hydrogen in place of methyl in the main-product.



$= N_3(CH_3)_{11}HBi_2I_7$
Tetramethyl ammonium-bismuth iodide.



$= (C_5H_5N)_3(HI)_3Bi_2I_6$
Pyridine ammonium-bismuth iodide.

Analagous to
$(C_{17}H_{23}NO_3)_3(HI)_3Bi_2I_6$.
Atropine bismuth iodide.

The alkaloidal bismuth iodides are not quantitatively uniform enough to be entirely satisfactory for alkaloidal assay, but are more stable and uniform than the alkaloid mercuric iodides formed by Mayer's reagent. On the other hand, they are more bulky, less easy to gather in a compact mass, less manageable in filtration. On the whole, so far as found, Dragendorff's reagent gives no general advantage over that of Mayer, though I am well aware how unsatisfactory the latter has been found in the hands of analysts.

For the execution of the work upon tetramethyl-ammonium-bismuth iodide, I am wholly indebted to Mr. H. E. Brown; for that upon the bismuth iodides of pyridine and the alkaloids to Mr. O. C. Diehl.

Ann Arbor, Mich., August, 1897.

EXAMINATION OF POWDERED VEGETABLE DRUGS.

BY HENRY KRÆMER.

Powdered drugs and "pressed herbs" will, no doubt at a not very distant day, be the form in which most of the vegetable drugs will be bought and sold by the apothecary. It seems reasonable to suppose, however, that a few drugs, as licorice root, slippery elm bark, chamomile flowers, rhubarb, orris root, Canada snakeroot, senna leaves, manna, etc., will always be obtainable in a more or less crude condition, as most of these require that they be broken as little as possible for some of the purposes for which they are used. But even these may be ground and compressed into forms, as "rhubarb fingers," that may be in keeping with more elegant pharmacy.

Some of the manufacturers, at least, of powdered vegetable drugs and "pressed herbs" have overcome nearly every objection that might be

raised against their products. They have done, moreover, the art of healing an immense amount of good, inasmuch as their products are sold in proper containers or are wrapped so as to insure against the maximum amount of deterioration. It is well known that the average pharmacist pays very little attention to the preservation of all his stock of crude vegetable drugs. The number of suitable containers is generally few, and the stock is necessarily in very great excess of these. Those that have no proper receptacles, as well as the over-abundance of drugs purchased for which no suitable containers are provided, are wrapped in what is by no means impervious paper, and stored away either on top of each other, or side by side, or both, in an "out of the way" place.

Some of the *advantages in the buying* of powdered drugs are:

(1) That they are ground, by the manufacturer of pharmaceutical products, to the fineness specified by the U. S. Pharmacopœia, or, when the drug is not official, that which is generally used.

(2) The pharmacist is saved the expense for apparatus, as a drug-mill, sieves, etc.

(3) He, furthermore, saves time in grinding the crude drugs or attending to the same.

(4) The powdered drugs, which he purchases, are in impervious containers and of such a form that he does not hesitate to place them on his shelves or his "out of the way" place, be it the hottest place of his store (over the cases) or in the most humid part.

(5) No additional expense may be felt by the pharmacist for securing other containers than those in which his products come to him.

Some of the *disadvantages* in the purchasing of powdered drugs are:

(1) That the drug in this condition costs from 5 to 50 per cent. more.

(2) The apprentice does not obtain the kind of practical experience in grinding drugs that will be always of inestimable value to him in determining either their identity or quality.

(3) The product which has been ground by some one else is likely to be more uncertain than one ground by the pharmacist himself from crude drugs of which he can so readily test the quality.

(4) There is at present no easy method for the average pharmacist to determine the purity of the powdered drugs he purchases.

Now some pharmacists have the idea that a large sum of money must be expended in order to be able to grind one's own drugs; that, for instance, steam power is necessary, an expensive mill must be provided, and a special room set apart for doing this kind of work. The fact of the matter is that such an expensive and elaborate plant is impracticable as well as unnecessary. Comparatively little money need be expended to purchase a good hand-mill and the necessary sieves, etc. With but very little outlay the retail pharmacist can grind his own drugs and overcome the disadvantages above noted. It is not the object of this paper, how-

ever, to discourage the buying of powdered drugs or even to compare the expense of grinding either commercial drugs or those of one's own collecting with that of the commercial powdered products, but to consider the qualitative and quantitative investigation of powdered drugs.

QUALITATIVE EXAMINATION.

We are indebted particularly to the labors of Flückiger, Wigand, Vogl, Arthur Meyer, Moeller, Tschirch, Schrenck, and others, who during the past ten years chiefly have given to us in their publications the characteristic structures of many of our crude drugs. All this has been necessary and is a preparation for the study of powdered drugs. While much has been done, even in the study of powdered products, there still remains much to be done in the study of both crude (particularly American) and powdered drugs. Several things are necessary for the study of powdered drugs:

I. Suitable methods for the rapid discrimination and study of the characteristic tissues and contents of the powder. While sections of the fine particles can be made (by holding the particle between the forefinger and thumb and drawing the razor through the specimen), still this is laborious and requires considerable practice, time and confidence. It is therefore necessary to devise means and employ reagents which shall make the specimen transparent and not destroy either the tissue or contents that need to be seen. The most satisfactory reagent for general purposes in the hands of the writer has been the employment of the following solution:

Chloral-Glycerin Solution.

Glycerin (C. P.) } equal parts.
Distilled water }
Chloral, sufficient to saturate the solution.

A few drops of this solution are placed on the slide and 0.002 to 0.008 Gm. of the powder added. The cover glass is put on the specimen and the preparation is heated gently over either a spirit-lamp, gas flame or oil-lamp until it begins to boil. This is then allowed to cool and examined. If not sufficiently transparent it is heated again. This is generally not necessary, as with but one heating the tissues are transparent and the contents may be examined. It is true that this treatment causes a slight swelling of the cell-wall and is not applicable in testing for starch. But this reagent has the advantages of clearing the specimen and preventing it without further treatment from drying out.

When examining the starch another solution is used, as follows:

Chloral-Glycerin Solution and Iodine.

Chloral-glycerin solution: any convenient quantity. Iodine: sufficient

is added to saturate the solution. This solution is placed on the slide and the same quantity of powder used as before, but heat is not applied. The starch grains, with all of the characteristic markings, will be brought out and may be studied.

When lignified cells are sought the powder must first be moistened with a drop or two of the following solution of anilin hydrochloride, and then, after a few minutes, a few drops of the chloral-glycerin solution may be added:

Anilin Hydrochloride Solution.

Anilin hydrochloride	5 Gm.
Hydrochloric acid (C. P.)	25 C.c.
Alcohol (95 per cent.)	25 C.c.
Distilled water	50 C.c.

The anilin hydrochloride is dissolved in the alcohol, and to this solution the water containing the hydrochloric acid is added. When this solution is used, of course, crystals of calcium oxalate or calcium carbonate are destroyed. The author is at present at work upon other solutions, having the same principle in their composition as the above, but those mentioned are all that are necessary generally, and have been used with success.

II. All investigators should record the size of the tissues or their contents in microns. The length of bast or wood fibres, size of pores, crystals, starch grains, stone-cells, etc., are all, more or less, characteristic for the drugs we have to consider. It is not sufficient to say that drawings were made by the use of a $\frac{1}{8}$-inch objective and a one-inch ocular. The objectives and oculars of the various makes of microscopes not only magnify differently, but the question of tube-length is also important in this connection. But even if all these data were given, it must be conceded as being tedious to the reader to calculate the size of the elements, which might be so easily done by the author. Even for an investigator to say that his drawings are magnified so many diameters does not give us the true and scientific idea of the elements which the author has seen and we desire to use in the study of powdered drugs. We need records in microns of the size of tissues and constituents of drugs from many sources for comparison, so that another investigator may readily get at the facts. This is the only scientific method for the prosecution of this kind of work, and must be rigidly pursued by all.

III. A scheme for the logical qualitative determination of a powder is necessary. It will be somewhat difficult to work out a scheme that will be of practical benefit, because it is necessary to begin with the consideration of the characteristics of all the drugs and adulterants that may be used. It will not be possible to separate, for instance, the leaves from roots, etc., as is done in the study of crude drugs. Many points, such as color, taste, odor, as well as constituents, structural characteristics, etc., must be con-

sidered. The author is at present engaged in a work having for its object the identification of a powder and the quality of it, and hopes to have it completed during the coming year.

IV. Furthermore, it is necessary for all those who have to do with the training of the apprentice, and the buying and selling of powdered drugs, to engage in the study of the same until the most satisfactory methods for determining the identification and quality be ascertained. In our educational institutions there is little or nothing being done, apparently, in this direction. It seems that the time is ripe for some time to be given in the study of powdered drugs in connection with that of crude drugs. This will, undoubtedly, be of the most practical benefit, as powdered drugs are already handled by most pharmacists, to some extent at least.

This subject of the investigation of powdered drugs is one of great importance to-day. The older method of teaching pharmacognosy in this country must be supplanted by the new, having for its object the study of the powdered commercial drugs. This knowledge ought to be demanded by our State Boards of Pharmacy. It is in keeping too with the desires of the professional pharmacist, as it will tend to keep out the competing "merchant" and "grocer." Our "Pure Food and Drug Laws" will require the pharmacist to know the value of the drugs and foods he sells. This may be required also of the grocer, but he can sell and buy in original packages. The pharmacist is hardly in the same position, as he cannot always dispense in original packages, and he is responsible for the purity of the goods that he possesses and sells. The conscientious pharmacist wants this knowledge; desires just laws, stringent examinations, and will, in his every-day dealings, live up to what he knows. He has nothing to lose; it is only the incompetent or dishonest dealer in drugs and foods that will suffer.

QUANTITATIVE EXAMINATION.

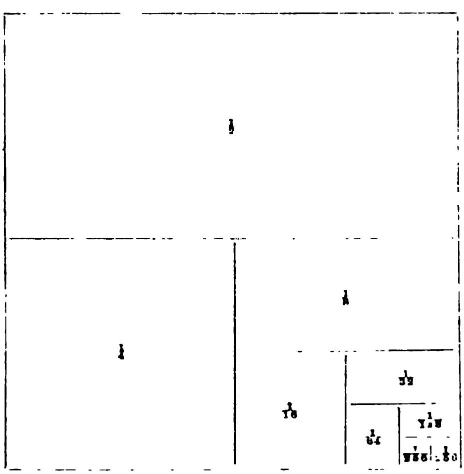
In a paper presented to the A. Ph. A. in 1894, a preliminary notice of a method for securing approximate quantitative results of the examination of a powder by means of the microscope, was given. After a few years of deliberation and some practice, the principles of the process are somewhat more satisfactorily developed, and the results will be given. Since 1894, the results of several workers, Day (A. Ph. A., Proc., 1896) and Kebler (Amer. Jour. Pharm., 1897, p. 244), as well as the labors of some students during the past year, indicate that the principle of the process suggested is satisfactory, whatever may be the modification recommended. The following are the important points embracing the principles of the process as developed thus far:

1. The same *reagents* and mounting media are employed in doing quantitative work, as were considered in the qualitative examination of the powder. In quantitative study, not only some but *all* of the important characteristic tissues and contents are to be rendered visible.

2. The quantity of powder to be examined by means of the microscope must represent the sample in every particular; in other words, *the sampling must be done properly,* and in accordance with the methods used in the assay of ores. While the quantity to be examined may consist of but a few grammes, it must thoroughly represent the lot of powder on which value is to be given.

3. The standard powders, with which the powder under investigation is to be compared, must thoroughly represent the drug in the various ways in which it may be treated. The degree of fineness must especially be carefully borne in mind. A sample of a drug of No. 40 powder, cannot be compared with one of No. 60. If the sample of a drug to be examined is of a No. 40 powder, the standards must also be of the same degree of fineness. If extraction of active principles is suspected in the powder under examination, it must be compared with a standard that has been extracted. In fact *every treatment that is possible in a sample to be analyzed, must be given to a standard with which the comparison is made.*

4. The *amount of powder* used in the examination is generally about $\frac{1}{256}$ Gm. (= 0.0039 Gm. = 0.06 gr.). In some cases twice this quantity ($\frac{1}{128}$ Gm.), or but one-half this amount ($\frac{1}{512}$ Gm.) may be used to greater advantage. The quantity of powder may be weighed out, or what is more convenient with practice, a gram is weighed out and divided with a spatula with the eye, as follows:



$\frac{1}{2}$ = 0.500 Gm.
$\frac{1}{4}$ = 0.250 Gm.
$\frac{1}{8}$ = 0.125 Gm.
$\frac{1}{16}$ = 0.0625 Gm.
$\frac{1}{32}$ = 0.03125 Gm.
$\frac{1}{64}$ = 0.0156 Gm.
$\frac{1}{128}$ = 0.0078 Gm.
$\frac{1}{256}$ = 0.0039 Gm.

5. The *cover glasses* used, whether round or square, *should be uniform in size and thickness,* for comparison of the mounts of the standard with those of the specimens to be tested.

6. The *amount of reagent* employed in making a mount, must be just sufficient to float the cover glass, and as few air-bubbles as possible are permitted to be formed.

7. A *homogeneous mixture* of powder with reagent must be formed before the cover-glass is put down. This is best done by taking the edge of the cover-glass in a pair of forceps and distributing the powder in the mounting media or reagent.

8. After the mount has been made and the powder examined previously qualitatively, the quantitative estimation of the composition of the powder is determined. This is based on one or more of the structures or constituents that are characteristic of the drug or drugs that may be present. A few examples may be given:

In *Cinchona*, the bast fibres are best selected.

In *Quillaja*, the monoclinic calcium oxalate crystals are most characteristic.

In *Belladonnæ Folia*, the pieces of tissues with some cells containing the characteristic grayish sand-like crystals of calcium oxalate are selected.

In *Hyoscyami Folia*, the pieces of tissue with some cells containing the characteristic cubical or tetragonal crystals of calcium oxalate are used.

In *Stramonii Folia*, the pieces of tissue with some cells containing the characteristic "rosette-shaped" crystals of calcium oxalate are most characteristic.

In *Zingiber*, the estimation is based on the starch grains, or better the oil-secreting cells.

In *Scilla*, the number of cells with groups of acicular crystals are best selected.

In *Belladonnæ Radix*, the starch grains are most easily used, but it must be borne in mind that there are several kinds of belladonna root in the market.

In *Nux-Vomica*, the lignified hairs are most characteristic.

In *Rheum*, the large "rosette-shaped" crystals of calcium oxalate are best selected.

In *Caryophyllus*, the oil-secreting reservoirs are used.

In *Cinnamomum*, the groups of stone cells or starch grains are characteristic taken in connection with the presence or absence of cork cells.

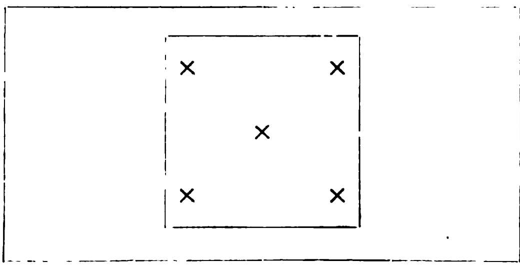
In *Sarsaparilla*, the starch grains are considered after the kind of root has been ascertained.

In *Glycyrrhiza*, the characteristic fibres with calcium oxalate crystals adjoining them, or the starch grains are employed.

(9) The *method consists in counting the number of characteristic elements in several portions of the slide*, and may be performed in several ways:

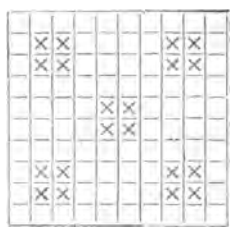
(*a*) By the use of an ocular micrometer ruled in 100 square millimeters as proposed in 1894. Five portions, at least, of the mount are examined, as in the places marked × in Fig. 1.

FIG. 1.



The characteristic elements that appear in each of these places in certain portions of the ocular micrometer are counted, as, for instance, those that appear in the square millimeters marked × in Fig. 2.

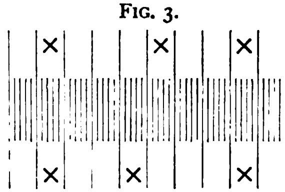
FIG. 2.



The low power ($\frac{1}{2}$–$\frac{2}{3}$ in. objective) is used in some cases, as in the estimation of Rheum, Scilla, etc., but in most instances, especially where starch grains are to be counted, the high power ($\frac{1}{4}$–$\frac{1}{5}$ in.) is preferred, as in Belladonnæ Radix, Zingiber, etc.

(*b*) While these ocular micrometers, ruled in square Mm., are easily made, still the makers of microscopical accessories charge such an exorbitant price for the same that it has been found desirable to devise another way for doing the same kind of work. An ordinary ocular micrometer, divided into 10ths of Mm., is taken, and the elements between the outer portions ruled to a less number of divisions (as those marked × in Fig. 3) are counted.

FIG. 3.



It is better when using this ocular micrometer to turn the latter around 180° after counting in the one direction, and count again. In other words, an additional count is made, *i. e.*, 10 are made upon each mount.

(*c*) There are some cases where it is not desirable to use either (*a*) or (*b*), as when the elements or tissues are so large that it is more practicable to exclude the ocular micrometers and count all of the tissues or constituents as they appear in the whole field of view of × in Fig. 1. The low power (⅔—½ in.) may be used sometimes, as in the estimation of Cinchona, Quillaja, Glycyrrhiza, etc., while in other drugs, as Hyoscyami Folia, Belladonnæ Folia, etc., a higher power (¼ to ⅕) is used.

(10) The *number of mounts* to be made of the standard and the powder under examination should generally not be less than 12 each. But as 2 to 3 mounts can be made upon the same slide, from 4 to 6 slides only are necessary for each powder.

(11) If the powder is found to be a mixture, a similar compound representing the proportions found should be made up and the powder under investigation be compared with it.

(12) It is apparent that the quantitative results are purely comparisons of an unknown with a known powder. The conditions must be nearly the same in both. The sampling must be done similarly; the same amount of powder must be used in both, and no more reagent or mounting media should be used than is necessary to hold the cover glass without any air being enclosed. The same microscope and powers, as well as other conditions, must be employed to secure even *approximate results*, as this is *all that can be expected at present.*

It would be useless for the author to record some of his standards and results, but it no doubt will be profitable to give the records of one or two instances where a number have worked upon the same powder.

Standard of Nux-Vomica.

No. 1.	Mean of	10	readings	12	hairs.
No. 2.	"	8	"	12⅓	"
No. 3.	"	10	"	10.9	"

A sample of Cinchona that contained 75 per cent. of Cinchona and 25 per cent. of wheat starch was assayed by the process given under 9(*b*) for starch and 9(*c*) for bast fibres, and gave the following results to 9 different workers:

					Cinchona.		*Starch.*
No. 1.	Mean of	20	readings	gave	74	per cent.	23 per cent.
No. 2.	"	10	"	"	67	"	
No. 3.	"	20	"	"	82	"	25 "
No. 4.	"	12	"	"	77	"	28 "
No. 5.	"	16	"	"	66	"	35 "
No. 6.	"	12	"	"	77	"	27 "
No. 7.	"	11	"	"	69	"	23 "
No. 8.	"	20	"	"	80	"	30 "
No. 9.	"	28	"	"	75	"	22 "
Total	"	149	"	"	74.11	"	26.66 "

Conclusion.—We need more effective work in the qualitative study of drugs, and we have some recent evidences that this will be done in this country.

Approximate quantitative results may be obtained in the examination of unknown powders by the methods given. There are some cases at least where the quantitative determinations of admixtures and adulterations, if they are to be determined at all, can be done only by means of a microscopical method.

It is possible that a microscopical separation of active principles may be effected of both drugs as well as their preparations. This would be the desideratum in qualitative microscopical work. Thus far, the work of the author in this direction has been unsatisfactory, because while at times results came, still the products disappear as quickly, owing no doubt to microscopic conditions of heat and moisture altering the products formed.

FLUID EXTRACT OF WILD CHERRY.*

BY JAS. M. GOOD, ST. LOUIS.

By the official process for fluid extract of wild cherry, the bark, in coarse powder, is macerated for forty-eight hours, after being moistened with a menstruum, consisting of glycerin one volume, water two volumes.

The exhausting menstruum is a mixture of alcohol and water in the proportion of eighty-five volumes of the former to fifteen volumes of the latter. We are left to infer that this menstruum was decided upon after deliberation and experiment.

To me, the reason for making it so strongly alcoholic is not evident. There is a demand for a fluid extract of this drug which would be miscible with aqueous liquids. It comes principally, we admit, from those who through indolence or inertia are given to the practice of making syrups, tinctures and wines by diluting fluid extracts.

There are doubtless occasions when the most scrupulous among us would be willing to take advantage of such convenience to meet an emergency, but the disposition on the part of pharmacists to avail themselves of what is "ready-made" needs to be resisted and discouraged. However, at the risk of being considered inconsistent, I offer a formula for a fluid extract of wild cherry which will yield a product giving a clear mixture with wine or syrup.

It differs from the official article in both the menstruum and the process, except in moistening the ground bark and the time allowed for maceration and fermentation. To insure a good product, carefully selected bark should be taken and reduced by grinding to a number twenty powder. The

* Since adjournment of the meeting at Lake Minnetonka, the author of this paper has learned that in 1895 a similar process was suggested in one of the text-books on Pharmacy, as an improvement on the official formula. J. M. G.

whole bark should be purchased, for reasons which need no explanation here.

Of this ground bark one thousand (1000) grammes are to be taken and divided into portions of two hundred and fifty (250) grammes each, and exhausted with a menstruum consisting of a mixture of two hundred (200) cubic centimeters of glycerin, two hundred (200) cubic centimeters of alcohol, and six hundred (600) cubic centimeters of water; the process to be employed being that of repercolation. Each portion of drug (250 Gm.) is, before percolation, to be moistened with a mixture consisting of glycerin 25 Cc. and water 50 Cc., packed firmly in a cylindrical glass percolator, closely covered and macerated forty-eight hours. In the initial operation the reserved portions may be, from percolator number one, 150 Cc.; from percolator number two, 200 Cc.; from percolator number three, 250 Cc.; from percolator number four, 300 Cc.—a total of 900 Cc. The final weak percolates being collected in portions and used in subsequent operations as a percolating menstruum, 1000 Cc. of fluid extract being made from 1000 Gm. of drug. The process of "fractional percolation," the details of which are given in the last edition of the "National Formulary," could be adapted to the preparation of this preparation. I submit samples of the fluid extract and the syrup. The astringency of the tannin, and the strong odor and taste of hydrocyanic acid, are very pronounced.

The syrup is made by taking an equivalent of the bark in fluid extract; that is, fluid extract 150 Cc. and syrup sufficient to make 1000 Cc. These samples have been but recently prepared. It is possible that they may not remain permanently clear, but I have confidence that they will be entirely satisfactory in this respect.

IS GLUCOSE OR GRAPE SUGAR OF ANY VALUE AS A PRESERVATIVE IN SYRUP OF HYDRIODIC ACID AND SYRUP OF FERROUS IODIDE?

BY DAVID WALKER.

Upon receipt of the list of queries sent out by the committee of the American Pharmaceutical Association for the 1897 meeting, I selected the above for the purpose of investigation preparatory to answering it.

The work on syrup of hydriodic acid was put off from time to time until I found it was too late to attempt it for this meeting.

A solution of ferrous iodide was prepared in accordance with the U. S. P., 1890, and filtered into one-half the weight of syrup therein directed.

The product was divided into two equal portions. To one of these portions syrup was added to bring it up to the required weight, and glucose was added to the other portion to make it of correct weight.

To test their respective keeping qualities two-ounce flint prescription vials were used, and all exposed to diffused sunlight and like conditions of temperature, by placing them side by side on a shelf in the laboratory of the store.

Half of the bottles were completely filled according to pharmacopœial directions, and the other half were purposely only half filled, to show effect of exposure to air.

The results are shown by the following tabulated statement, and by the samples in their original containers, which are submitted for inspection:

Sample.	Date of Manufacture.	REMARKS.	1st week.	2d week.	1st month.	2d month.	4th month
A	Feb. 15, '97.	U. S. P. syrup kept in completely filled 2 oz. bottles:	No change.	Slight oxidation at top.			Faint yellowish tint.
B	Feb. 15, '97.	Same as sample A kept in half filled bottle.	Straw yellow.	Pale sherry color.	Showed free I.		Dark sherry color.
C	Feb. 15, '97.	Same as sample A with addition of 2 drops of dilute hypophosphorous acid to fluid ounce. Kept in well-filled bottle.	No change.				No change.
D	Feb. 15, '97.	Same as sample C, kept in half filled bottle.	No change.				No change.
E	Feb. 15, '97.	Half of syrup displaced by glucose kept in completely filled bottle.	No change				No change.
F	Feb. 15, '97.	Same as sample E, kept in half filled bottle.	No change.	No change.	Slight oxidation.	Pale sherry.	Reddish brown color.
G	Feb. 15, '97.	Same as sample E with 2 drops dilute hypophosphorous acid to fluid oz., filled bottle.	No change.	No change.	No change.		Faint yellowish tint.
H	Feb. 15, '97.	Same as G, kept in half filled bottle.	No change.	No change.	Slight oxidation.	Pale sherry, trace of I.	Lemon yellow.
I	Mar. 27, '97.	Made U. S. P. with glucose instead of syrup.	No change.				No change.
J	Mar. 27, '97.	Same as I, kept in half filled bottle.	No change.				No change.

Sample A kept fairly well, but shows a little discoloration after a few months.

Sample B began to oxidize in twenty-four hours, and after one month showed presence of free iodine.

Samples C and D are apparently unchanged.

Sample E has kept perfectly, but when exposed in partially filled bottle (F) did not show discoloration for nearly a month, but after that changed very rapidly.

Sample H indicates that glucose interferes with the preservative action of hypophosphorous acid.

The use of all glucose instead of syrup yields a more permanent preparation than a mixture of glucose and syrup.

My answer to the query therefore would be that glucose is valuable as a preservative of syrup of ferrous iodide, the more glucose (and less syrup) the better.

Unless the use of dilute hypophosphorons acid is objectionable from a therapeutic standpoint, I would recommend it as far superior to glucose as a preservative.

Kansas City, Mo.

THE IMPORTANT CONSTITUENTS OF TARAXACUM ROOT.

BY L. E. SAYRE.

According to the promise made at the meeting of this Section last year, the investigation upon Taraxacum has been continued. It was begun not without considerable misgiving, but with the hope that some process for crystallizing the bitter principle would be found, so that a more accurate study of its chemical and physical properties could be accomplished, and that a method of accurately standardizing this much-used drug could be furnished.

Briefly summarizing the work of which this is a continuation, it will be seen, by referring to the papers previously published in the Association Reports,* that the following constituents, among others less important, have been identified: (1) a resin soluble in chloroform and ether, insoluble in alcohol; (2) a resin soluble in alcohol; (3) Taraxacerin, a white waxy substance separating from alcoholic solution in cauliflower-like forms; (4) a bitter principle, which in somewhat concentrated solution is precipitated by a number of alkaloidal reagents. Solutions containing the seemingly pure principle when evaporated produced a film which under the microscope revealed oftentimes crystals of acicular form mixed with globules of oleo-resinous appearance. When this mixture was treated with oxidizing agents—even by hydrogen peroxide—it was gradually converted into a crystalline mass which proved to be oxalic acid. Attempts to separate the crystals found in the unoxidized evaporate were unsuccessful. To decide whether these crystals or the oily globules were the bitter principle, or whether the one was derived from the other, was little more than a conjecture. Slow evaporations of chloroformic, ethereal, alcoholic and aqueous solution failed to produce crystals free from oleo-resinous globules, Evaporation of aqueous solution in vacuo was no more successful.

The work was begun this year by making an ultimate analysis of taraxacerin. Slowly evaporating its impure alcoholic solution, the cauliflower-like crystals separated as stated in paper of last year. The taraxacerin thus freed from extraneous matter was collected, dried over sulphuric acid, and a number of combustions made. The result of these combustions will be subjoined to this paper. A quantitative analysis of the inorganic constituents of taraxacum root will also be appended.

For the further investigation of the bitter principle an extraction of taraxacum root was made for me by J. U. Lloyd, as follows: Forty pounds of the powdered root were percolated with chloroform and the dregs were then exhausted with alcohol. The chloroformic and alcoholic tinctures were separately distilled, leaving behind in each case a residue of thick syrupy consistence. These syrupy extractives were used as a starting point for the further investigation of taraxacin and other constituents.

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* See Proc. A. Ph. A. 1896, p. 160.

Taraxacin, bitter principle.—Further efforts have been made to bring the bitter principle to the crystalline form. Thus far these efforts have been only partially successful; a detailed description of this work is unnecessary. Suffice it to say for the present, acetone as a solvent seems to promise some aid in its isolation. An acetone solution of the yellowish, amorphous, viscid and extremely bitter extractive (corresponding to crude taraxacin) was made. On slowly evaporating this solution a thin, syrupy, transparent film was left which contained imperfectly-formed stellar crystals—tufts imbedded in viscid media. On adding a drop of water the film and crystals immediately broke down into yellowish oleo-resinous-like globules. The most satisfactory method thus far employed for purifying this principle is to dissolve crude principle (extractive) in 20 per cent. alcohol, treat this with specially-purified animal charcoal until the solution loses its bitterness; carefully wash the carbon with water, dry, and treat it with boiling alcohol, evaporate the alcoholic solution at a low temperature and dry the residue over sulphuric acid. This has, however, the disadvantage of being a wasteful process. The dried product dissolved in acetone behaves as stated above.

Although the crystallization of taraxacin at present seems almost impossible, it has not been given up as hopeless.

Analysis of Taraxacerin.—The result of the combustion of this principle may be here stated. Several combustions were made, but only three recorded; of these three the second and third seemed to be the most reliable. A tabular statement of the percentages is as follows:

	1.	2.	3.
Carbon	77.36	77.16	77.32
Hydrogen	11.55	11.13	11.13
Oxygen	11.09	11.71	11.55

Mean of 1, 2, 3:		Mean of 2 and 3:	
C	77.28	C	77.24
H	11.27	H	11.13
O	11.45	O	11.63

Reducing the percentages of the last table the following amounts appear:

$$C = \frac{77.24}{11.92} = 6.4803 \qquad \frac{6.4803}{.7324} = 8.85$$

$$H = \frac{11.13}{1} = 11.13 \qquad \frac{11.13}{.7324} = 15.20$$

$$O = \frac{11.63}{15.88} = .7324 \qquad \frac{.7324}{.7324} = 1.00$$

Taraxacerin would therefore correspond to the empirical formula $C_9H_{15}O$, or a multiple thereof.

The melting point of this substance was about 45° C. Its chemistry

will probably be worked out, in detail, in the future. For aid in this work in combustion, I am especially indebted to Mr. W. M. Whitten, Assistant in Chemistry of the Kansas University, who promises in the future to aid in its further study.

Inorganic Constituents of Taraxacum Root.—Ash in dried root (dried at 100° C.), 11.13 per cent.

Constituents of Ash.

SiO_2 and sand	43.27 per cent.
Al_2O_3	18.07 "
Fe_2O_3.	0.80 "
CaO	5.75 "
MgO	6.60 "
K_2O	13.83 "
SO_4	4.22 "
P_2O_5	trace.
CO_2	6.53 "
Cl	1.20 "
Total	100.27

This latter work was performed by Mr. C. M. Palmer, a senior student of the School of Pharmacy.

The examination of the chloroformic and alcoholic extractions was carried beyond the report made in this communication, but the interesting work is not yet completed, and will be made the subject of another paper at the coming meeting of the society.

GELSEMIC ACID.

BY VIRGIL COBLENTZ.

This principle was first isolated by Prof. Maisch in 1869, later named and fully described by Prof Wormley, in 1870. The latter author restricted himself to the application of various color tests and the deportment of this substance to different reagents, with the view of its identification from the standpoint of a toxicologist.

Dr. Chas. Robbins, in his work "Ueber die wesentlichen Bestandtheile von Gelsemium sempervirens" (1876), describes this principle as occurring in needle-like crystals which separate in stellate groups, possessing acid characters and forming salts with metallic bases, all of these salts being insoluble in water except those of the alkalies which are readily soluble and crystalline. As regards solubilities, the same author claims that gelsemic acid is readily soluble in chloroform and ether, and soluble 1 part in 1000 of water. A number of color reactions given by Wormley were reviewed by Robbins; these will be taken up later with criticisms and comments.

The material for the following investigations was supplied by Prof. J. U. Lloyd, who assured me of its purity and genuineness. The crystals were

white, when viewed in mass, of a slight yellowish cast; they were of the hexagonal system and varied in length from 5 to 10 mm.*

The melting point of gelsemic acid, which to my knowledge has not been published, at least not by the above named investigators, is 206° C. (corrected).

When heated between 110° and 115° C. for 5 hours in a tube through which a current of dry carbonic anhydride was passed, no appreciable loss in weight occurred; in the upper portion of the tube a slight sublimate was noticeable. This may account for Dr. Robbins' two molecules of crystal water; however, the solvent employed in crystallizing may account for differences. When heated in open air, gelsemic acid takes on a deep lemon yellow color.

SOLUBILITY.

One part of gelsemic acid is soluble in 1490 parts of distilled water at 30° C.; in 415 parts of absolute ether at 22° C.; in 135 parts of chloroform at 24° C. It is readily soluble in hot alcohol and glacial acetic acid.

The above figures show the average of three careful determinations each.

COLOR TESTS.

The reagents employed were first tested for such impurities as might affect the color reaction.

1. With conc. H_2SO_4 = pale yellow, disappears on standing.

2. With conc. H_2SO_4 warmed = deep yellow.

Prof. Wormley obtains a yellow to red-brown color with above.

3. With conc. H_2SO_4 + trace of HNO_3 = blood-red, quickly fades to yellow.

4. With conc. H_2SO_4 + $K_2Cr_2O_7$ = pale violet, changing to green.

Dr. Robbins obtains no reaction with 4.

5. With conc. H_2SO_4 + ammonium molybdate = yellow, on standing from 10 to 20 minutes = intense blue (hastened if warmed).

The reaction 5 is very delicate and characteristic.

6. With conc. HNO_3 = yellow, if gelsemic acid is in excess = reddish color, to this add NH_4OH in excess = intense blood-red color.

Above test of Wormley is sensitive to 0.00002 gm.

REACTIONS IN SOLUTION.

1. Gelsemic acid is readily soluble in diluted aqueous solutions of the caustic alkalies; the resulting solution is of a pale yellow color when viewed by transmitted light, by reflected light it exhibits an intense bluish-green fluorescence, 1 part in 1 million being distinctly fluorescent; this is destroyed by addition of acids.

2. An aqueous solution of gelsemic acid liberates iodine from iodic acid (HIO_3).

3. An aqueous solution of gelsemic acid on addition of ferric chloride gives a green-colored solution.

4. Lead acetate and mercuric chloride both produce, with aqueous solutions of gelsemic acid, yellow precipitates called by Robbins "gelsemates." These precipitates proved to be a mixture of basic hydroxides of the metal and unaltered gelsemic acid, the latter being readily removed by washing with hot water or alcohol.

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* Made from Gelsemium sempervirens by means of neutral solvents only, no acids or alkalies being employed. Purified by repeated crystallizations from alcohol.—J. U. L.

5. When silver nitrate is added to an aqueous solution of gelsemic acid, at first a yellow precipitate is produced, which quickly changes to black. Solutions of auric and platinic chlorides are reduced at once.

6. Fehling's solution, or a concentrated solution of copper sulphate, gives a brownish red precipitate of cuprous oxide on standing, or immediately on heating.

7. The addition of freshly prepared chlorine water to an aqueous solution of gelsemic acid produces a red coloration, which disappears on warming.

8. The addition of Lugol's solution produces a brown precipitate, which consists of a mixture of free iodine and gelsemic acid.

ANALYTICAL.

Dr. Robbins assumes gelsemic acid to be a glucoside after boiling its aqueous solution with dilute sulphuric acid and heating with Fehling's solution. In the above cited reactions we find that gelsemic acid is a strong reducing agent, acting even in cold solution; so this test is indeed, under the circumstances, fallacious.

Not a Glucoside.

To ascertain whether this principle is a glucoside or not, samples were boiled for twelve hours with diluted, also concentrated hydrochloric acid, also with diluted sulphuric acid; finally a sample was heated in a sealed tube with 5 per cent. alcoholic hydrochloric acid at 110° C; all gave negative results, the gelsemic acid remaining unchanged, and the solution failed to give any reaction for sugar with phenyl-hydrazine. Other sugar tests cannot be applied because of the above mentioned reducing properties of this principle.

Salts.

Robbins, as well as Wormley, calls attention to the acid properties of gelsemic acid; the former states that the salts, with the exception of those of the alkalies, are insoluble in water, while the latter are crystalline. Robbins assumed that the precipitate obtained by adding a salt of a metal to a solution of gelsemic acid, was a compound of the latter with a metallic base. I have already stated that these precipitates consist of a mixture of basic hydroxides and free acid.

I endeavored to obtain salts of gelsemic acid with the alkalies by cautiously neutralizing aqueous and alcoholic solutions of this principle with alkali carbonates and hydrates; the resulting solutions were concentrated at the lowest possible temperature and set aside for some weeks, with the result that nothing more than amorphous crusts could be obtained.

The dry sodium salt (so-called), when heated, becomes very voluminous —a phenomenon very similar to the "Pharaoh's serpent" produced on heating mercury sulfocyanide. I next attempted to produce a salt with the alkaline earths, by boiling gelsemic acid with freshly precipitated barium carbonate and water; also magnesium carbonate and water for several hours. The filtered solution was neutral, but, upon concentrating, the carbonated alkaline earth gradually separated, and the solution as-

sumed an acid reaction. No crystals separated from the solution upon standing.

From the above it will be seen that this principle possesses very feeble acid properties, and that its compounds are of an exceedingly unstable character.

Attempts were made to produce salts by double decomposition between the sodium compound of gelsemic acid in solution with salts of the metals, but the precipitates obtained were of the same character as those mentioned under test 4.

No Nitrogen.

Lasseigne's test for the presence of nitrogen was made with negative results, confirming Robbins' test.

Combustion.

Robbins, after making two combustions of gelsemic acid with copper oxide in a simple bayonet tube, as was customary at that time, and comparing his results with the older æsculin formula of Rochleder, comes to the conclusion that his gelsemic acid is identical with æsculin, reinforcing his opinion by comparing the fluorescent properties of both and their reducing powers on Fehling's solution. It is true that æsculin and gelsemic acid resemble one another in some particulars, such as fluorescence and reducing powers, but, as will be shown later, it will be seen that the latter is a distinctively different principle.

The two combustions of Robbins resulted as follows:

I.	$C = 52.04$ per cent.	$H = 5.189$ per cent.
II.	$C = 51.82$ per cent.	$H = 4.98$ per cent.

The older formula of Rochleder for æsculin contains C. 51.57 per cent. and H. 4.87 per cent. The later accepted formula contains C. 52.94 per cent. and H. 4.70 per cent.

The results of Robbins' analyses and the above formulæ correspond quite closely; however, the author questions the accuracy of the (Robbins) analyses and the formula deduced therefrom.

The greatest difficulty was experienced in obtaining concordant results in combustions of gelsemic acid, for this principle is one of those few organic substances which upon heating with copper oxide or oxidizing agents, tends to give up only a portion of its carbon as carbon dioxide, the rest separating as a graphitic-like deposit on the sides of the combustion tube, which the highest possible temperature cannot remove. Over 20 combustions were made after various methods; in several instances, even with cupric oxide alone, two of the combustions would correspond quite closely, but subsequent results did not justify that any reliance be placed upon the figures. The various methods employed were: first, com-

bustion with cupric oxide in a bayonet tube; second, with cupric oxide in an open tube in a current of oxygen; in the third method lead chromate was employed; the fourth method attempted consisted in mixing the gelsemic acid with powd. fused potassium dichromate in a platinum boat, and then burning in an open tube with cupric oxide in a current of oxygen; as fifth attempt, the method of wet combustion with a mixture of chromic anhydride and sulphuric acid was attempted, passing the gases through a spiral cooler, then over lead peroxide to remove sulphur dioxide, finally over calcium chloride into the potash absorption apparatus (see Amer. Jour. Phar., May, '97, p. 228). This method, although requiring the greatest care to prevent the contaminating gases from passing over, gave very good results in the analysis of some of the derivatives of gelsemic acid, while with the mother substance discordant results were obtained. Finally as a last resort a mixture of lead chromate three parts and red lead (Pb_3O_4) one part was tried, the combustion being carried on in an open tube in a current of oxygen. The two above mentioned ingredients were reduced to a fine powder, well mixed, moistened with water, granulated and sharply dried at 150° C. This mixture was introduced into an open combustion tube and heated to dull redness in a current of oxygen; then on cooling the well-dried sample of gelsemic acid which had previously been mixed with an ignited mixture of equal parts of powdered lead chromate and lead oxide was introduced, and the combustion carried on slowly in a current of oxygen, bringing the tube finally to a bright red heat. No traces of separated carbon could be found on the sides of the tube after combustion.

The analyses resulted as follows:

I	0.2432 Gm. substance yielded	0.5582	Gm. of	CO_2 =	62.59	per cent.	C.
	" " " "	0.0988	"	H_2O =	4.51	"	H.
II	0.1140 " " "	0.2610	"	CO_2 =	62.44	"	C.
	" " " "	0.0470	"	H_2O =	4.58	"	H.
III	0.2926 " " "	0.6739	"	CO_2 =	62.81	"	C.
	" " " "	0.1166	"	H_2O =	4.42	"	H.

From the average of the above analyses the formula $C_{18}H_{11}O_6$ was deduced; the percentage of carbon would be 63.16 and of hydrogen 4.45. Thus for comparison:

		Found.		
	Calculated.	I.	II.	III.
C	63.16	62.59	62.44	62.81
H	4.45	4.51	4.58	4.42

A molecular weight determination, which is of great assistance here, after the method of Beckmann (kryoscopic), was found impossible because of the insolubility of gelsemic acid in the cold solvents employed in these de-

terminations, with the exception of phenol, which, however, gave abnormal results, due probably to molecular action between the two.

ACTION OF PHOSPHORUS PENTACHLORIDE.

Gelsemic acid was cautiously fused with a slight excess of phosphorus pentachloride; to the mass water was added slowly, the tube being kept well cooled with ice. After standing a few hours a white mass separated, which, after thoroughly washing, was taken up with as little hot alcohol as possible, filtered and again precipitated in an excess of water. This operation was repeated several times in order to remove a non-crystallizable impurity which was comparatively insoluble in alcohol; finally the product was recrystallized twice from alcohol. This chloro-derivative of gelsemic acid melts at 190° C. A chlorine estimation was made after Carius. 0.015 Gm. of substance yielded 0.0616 Gm. of AgCl, which corresponds to 24.76 per cent. of chlorine. The theoretical replacement of *two* hydroxyl groups by chlorine would give us 25 per cent. of the latter. This proves conclusively that we have replaceable hydroxyl groups present.

$$C_{13}H_9(OH)_2O_3 = C_{13}H_9(Cl)_2O_3.$$

Calculated Cl = 25 per cent. Found Cl = 24.76 per cent.

ACTION OF ACETIC ANHYDRIDE.

Gelsemic acid was heated with acetic anhydride and anhydrous sodium acetate in a flask with reflux condenser for several hours; the reaction product was poured into an excess of water and the precipitate formed thoroughly washed, dried and crystallized from alcohol. This compound forms needle-like anhydrous crystals which melt at 180° C. The number of acetyl groups (C_2H_3O) entering this compound was determined by saponifying a weighed quantity in an excess of normal alcoholic potassium hydrate and then titrating back the excess of alkali by means of standard hydrochloric acid. Assuming that the two hydrogen atoms of the hydroxyl groups have been replaced by two acetyl radicals, we have the following:

	Calculated per cent. $(C_2H_3O)_2$.	Found.
$C_{13}H_9(C_2H_3O)_2O_5$	25.98	25.14

On adding bromine to a hot solution of gelsemic acid in glacial acetic acid, a voluminous white precipitate formed, which, when crystallized from alcohol, formed yellow needles which fused at 250° C. A further investigation of this body was postponed for lack of material.

Thus far, from the above results we may ascribe to gelsemic acid the formula $C_{13}H_9O_3(OH)_2$; considering the active reducing character of this principle it is highly probable that either an aldehyde or a ketone group is also present, which further investigation will determine. That gelsemic acid is identical with æsculin, as Robbins and others have assumed (dis-

puted by Wormley), is not possible, as the comparisons and criticisms of the combustions already given have shown; in addition to this further comparisons are given below. It may be possible that a relationship in certain groupings exists between these two principles, which, however, cannot be settled as yet.*

Æsculin.	Gelsemic Acid.
$C_{15}H_{16}O_9 + 1\frac{1}{2}H_2O$—melts at 160° C.	$C_{13}H_{11}O_5$—melts at 206° C.
Forms a penta-acetyl derivative — melts at 203–206° C.	Forms a di-acetyl derivative— melts at 180° C.
Splits up into sugar and æsculetin.	Does not hydrolyze.
Bromine derivative melts at 193–195° C.	Bromine derivative melts at 250° C.
Chloro subst. prod. not prepared.	Chloro subst. prod. melts 190° C.

The author desires to express his thanks to Prof. Dr. A. Hilger (Munich) for valuable advice given during a portion of the above investigations.

THE PREPARATION OF SOLUBLE FERRIC PHOSPHATE.

BY W. A. PUCKNER, CHICAGO.

The writer has elsewhere † published an analysis of Soluble Ferric Phosphate as found upon the market, which showed wide variations from the official in iron content, and still greater variation in the relation of iron to phosphoric acid in the various specimens. At the same time the causes of such variability were demonstrated and explained at length. The writer now begs to propose certain modifications in the working formula of the official process, which alterations will not only make the preparation more uniform in composition, but will also materially simplify the process of manufacture.

He would also ask if it be desirable to introduce a solution of Ferric Phosphate should such a preparation be found to be reasonably permanent.

On considering the official process for phosphate of iron it is readily seen that the composition of the finished product is a personal equation of each operator, depending upon operative skill or methods and the interpretation of the official requirements. Thus, in producing Solution Ferric Citrate from the tersulphate solution, a quantity of the latter is directed, which, could loss of iron be avoided in the conversion, would yield a citrate solution containing 8.4 per cent. metallic iron; the official process for washing ferric hydrate is however so wasteful that a considerable and

* "About fifteen years ago, I prepared for and presented Prof. Flückiger with a quantity of pure, white crystallized gelsemic acid. Prof. Flückiger became much interested in its chemistry and prepared some æsculin to compare therewith. He determined that they were different bodies, advising me of the fact by letter, stating that he would continue the investigation in which he was so deeply interested. The subject, however, rests among his uncompleted works, and, so far as I know, he did not publish his results."—From a personal letter from John Uri Lloyd, dated August 16th, 1897, after this paper was written.

† Western Druggist, 1896, p. 486.

of course variable loss must occur. This loss of iron is intended to be allowed for in requiring the finished preparation to contain only "*about 7.5 per cent;*" the word "about" no doubt being intended to convey permission of some variation of strength, the extent of the latitude thus allowed being a matter of personal judgment, and to be decided to suit the convenience of the operator.

The possible or even probable variation in iron content, is perhaps best illustrated by the statement that a solution prepared strictly according to the official formula, when using extreme care to avoid undue loss of iron in washing the hydrate, contained 8.1 per cent. of iron. Since the amount of citric acid directed in the solution is definite, the finished product will not only vary in iron strength, but also in relation of iron to citric acid, and may thus result in a nearly neutral or, if much iron was lost, a strongly acid solution.

The next step in the preparation of iron phosphate consists in obtaining the dry citrate from the solution. Here two causes of error exist. In the first place, a solution of high iron strength will yield a similar dry salt, while a solution containing a low per cent. of iron will, since this means an excess of citric acid, contain a less amount of iron. Secondly, the amount of water, and therefore, also that of iron, depends largely upon the concentration of the solution when spread upon glass plates. This latter is illustrated by the following: Portions of solution of iron citrate, containing 8.1 per cent. iron, were evaporated to varying degrees of concentration, all, however, coming within the official direction to evaporate "to consistence of a syrup," and yielded scale salts containing from 15.8 to 16.9 per cent. of iron.

Having converted the ferric citrate solution to the dry salt, we now proceed to again dissolve the same, add to this the sodium phosphate, then evaporate to syrupy consistence and spread on glass plates. In thus preparing the phosphate from the citrate, we introduce another source of error, namely, the amount of water contained in the scales, which, just as with the citrate, of course will vary with the conditions under which it is scaled.

Thus the composition of the finished ferric phosphate will depend upon the strength of the solution of ferric citrate used in its preparation, is liable to added variations incurred in the formation of the dry citrate, and is still further complicated during the scaling of the final product.

The following formula, aiming at the production of a preparation of less variable composition, as well as a simplification of the process, is submitted for trial and criticism :

SOLUBLE FERRIC PHOSPHATE.

Ferrous sulphate, in clear crystals	156 Gm.
Sulphuric acid	20 Cc.
Potassium chlorate	12 Gm.
Ammonia water	340 Cc.
Citric acid	120 Gm.
Sodium phosphate, uneffloresced	200 Gm.
Water	A sufficient quantity.

Add the sulphuric acid to 240 Cc. of water, contained in a glass or porcelain vessel, to this add the ferrous sulphate, warm gently until all is dissolved, then add the potassium chlorate and continue the heat for one-half hour, or until a drop of the solution added to potassium ferricyanide test solution no longer produces a distinct green or bluish-green color. Add this solution, slowly and with constant agitation, to the ammonia water contained in a suitable vessel; to this mixture add hot water 4000 Cc., and allow to subside and, after one-half hour, decant or siphon off the clear supernatant liquid. To the residue add 2000 Cc. hot water, allow to subside and decant; repeat this washing with six portions of hot water, allowing the last portion to subside for at least six hours or over night. Decant or siphon off the clear liquid as closely as possible, then add to the remaining magma the citric acid and the sodium phosphate, warm gently until solution results and then evaporate on a water-bath at a temperature not exceeding 60°C until the solution weighs 500 Gm., and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

The advantages claimed for this formula are: 1st. By substituting potassium chlorate for nitric acid, in the oxidation of the ferrous sulphate, the evolution of obnoxious fumes of oxides of nitrogen is avoided. 2d. The washing of ferric hydrate by decantation, as recommended by Markoe,* is easier of manipulation and, as practically no loss of iron need be incurred in the operation, one source of variation noted in the official process is thereby eliminated. 3d. The entirely superfluous scaling of ferric citrate solution is omitted, thereby eliminating the second source of variation. A considerable saving in time and labor is also effected, as ferric citrate, especially if not recently prepared, dissolves with much difficulty. 4th. The third source of variation noted in the official process for ferric phosphate, while not completely eliminated, is considerably lessened by directing the solution to be evaporated to a definite volume before being spread on glass plates.

SOLUTION OF FERRIC PHOSPHATE.

Although iron phosphate is extremely soluble in water, yet as is well known solution is effected with some difficulty, and since it is usually prescribed in the form of a solution, such solution, if found permanent, would

* Proceedings A. P. A., 1880, p. 459.

be a distinct saving of labor in the laboratory as well as at the dispensing counter.

While preparing iron phosphate according to the formula just submitted, a portion of the solution ready for scaling, of which two parts represent one part of Soluble Ferric Phosphate, U. S. P. '90, remained over and was transferred to a vial. The bottle was but partially filled, closed with a cork and kept in a dark place at ordinary room temperature. This solution, prepared on June 30, 1896, at the present time does not show any signs of decomposition. Larger portions were subsequently prepared and used with entire success in the compounding of elixirs, etc., and during the time that they were kept showed no signs of deterioration.

While these experiments are, of course, insufficient to prove that such a solution possesses sufficient permanence to warrant its introduction into the National Formulary or the United States Pharmacopœia, yet the writer hopes that they may induce others to prepare and test the keeping qualities of Solution of Iron Phosphate.

The following formula will yield a solution of which 2 Cc. are equivalent to 1 Gm. Soluble Ferric Phospate, U. S. P. '90.

SOLUTION FERRIC PHOSPHATE 50 PER CENT.

Ferrous sulphate, clear crystals	156 Gm.
Sulphuric acid	20 Cc.
Potassium chlorate	12 Gm.
Ammonia water	340 Cc.
Citric acid	120 Gm.
Sodium phosphate, uneffloresced	200 Gm.
Water	A sufficient quantity.

Add the sulphuric acid to 240 Cc. of water, contained in a glass or porcelain vessel, to this add the ferrous sulphate, warm gently until all is dissolved, then add the potassium chlorate and continue the heat for one-half hour, or until a drop of the solution added to potassium ferricyanide test solution no longer produces a distinct green or bluish-green color. Add this solution slowly and with constant agitation to the ammonia water contained in a suitable vessel; to this mixture add hot water 4000 Cc., allow to subside, and after one-half hour decant or siphon off the clear supernatant liquid. To the residue add 2000 Cc. hot water, allow to subside and decant; repeat this washing with six portions of hot water, allowing the last portion to subside for at least six hours or over night. Decant or siphon off the clear liquid as closely as possible, then add to the remaining magma the citric acid and the sodium phosphate, warm gently until solution results, and then evaporate on a water-bath at a temperature not exceeding 60° C. until the solution measures 500 Cc.

CHEMICAL COMPOSITION OF COMMERCIAL EXTRACT OF WITCH-HAZEL.

BY JOSEPH FEIL, PH. G.

For a long time past a liquid with distinctive characteristic properties has been extensively prepared by certain manufacturers, as far as I can learn, almost exclusively in the New England States and especially largely in the State of Connecticut; this article has a ready sale in most pharmacies and is often purchased in barrel quantities; it is also freely sold in many other business establishments.

It is colorless, has a peculiar odor, a rather slightly mawkish, somewhat saccharine taste, does not change when kept under ordinary conditions or if exposed for some time to direct sunlight, remains clear, and as it is almost invariably used without admixture, may be said to present no pharmaceutical, chemical or therapeutical incompatibility. It has been recently suggested that the article is a solution of formaldehyde, and as it is greatly used it is exceedingly important to know its chemical nature, hence I examined it with great care.

The mode of its preparation is to some extent a trade secret, but practically it is nothing more than a distillate prepared by macerating a certain quantity of witch-hazel leaves with a menstruum consisting of 85 per cent. water and 15 per cent. cologne spirits and distilling after twenty-four hours. Undoubtedly each manufacturer has his own special manipulations and time for collection of the leaves, and some distil with water only and add the alcohol afterwards, but practically there is no very perceptible difference in the products found in the market. It therefore follows that the peculiar preperties of the extract must be due to one or more substances of a definite chemical composition, and whatever this may be, it has proved very elusive so far.

The first attempt to discover its nature was to test for formaldehyde and its various possible derivatives and combinations. I shall not attempt to describe or enumerate all the substances searched for, as it would be a monotonous repetition without value of "not found."

In the various experiments made I used tests found in the following authorities: Richter—Organic Chemistry; Watts—New Dictionary of Chemistry; Thorpe—Dictionary of Applied Chemistry; Allen—Commercial Organic Analysis; Roscoe & Schorlemmer—Chemistry, and others.

The distinctive tests for formaldehyde were so positively negative in every instance that I have been unable to imagine how the substance could have been considered present, and on searching far and wide into the literature on the subject have been unable to find more than one test mentioned, namely, that silver nitrate was reduced by the liquid; as this is the case with a legion of other organic compounds, the statement certainly has no value.

After a long siege of the "trial and error" method I found that a green

color was produced by ferric chloride, changing to red on boiling and changing back to green when hydrochloric acid was added, with development of a chlorination odor; caustic potash produced a yellowish-green, turning somewhat brown on exposure to air with the production of a very familiar odor, namely, that found when the same reagent acts on many somewhat resinous substances; the combination of the above reactions gave me the key to the whole situation, as it is well known that ferric chloride gives a green color with all protodioxy-benzene derivatives, even if an atom of hydrogen has been replaced by an alkyl.

Ammoniacal silver nitrate is reduced, but by no means as violently as even very dilute solutions of formaldehyde give, and the solution is entirely without action, cold, hot, or on prolonged contact with Fehling's solution. It has a slightly acid reaction to blue litmus paper.

A white precipitate is produced by lead acetate, and when the extract is shaken with ether, U. S. P., 90, the peculiar matter passes into the ether, and on separation and evaporation of this solvent the residue has the characteristic physical and chemical properties of the liquid; the same substance is obtained on evaporating the extract on a water bath; this yellowish extraction is present in nearly the same quantity in various specimens and averages about 1 part in 3000, or approximately 2½ grains in a pint.

The amount of alcohol indicates the quantities which the better class of manufacturers of this article claim, namely 15 per cent.; of course it varies some, but as a whole is never more than say ½ per cent. from the amount mentioned. One specimen obtained in a grocery store had evidently been diluted, as it tested approximately only 10 per cent. spirits.

All these considerations point to but one substance representing the peculiar properties of extract of witch-hazel, and that is protocatechuic acid, called also carbohydro-quinonic acid, with a formula of $C_6H_3(OH)_2.CO_2H$ (1 : 3 : 4, CO_2H in 1). This substance can be prepared by many different methods mentioned in all standard works on organic chemistry. It is stated in Merck's Index to be astringent.

Considering the close relation this substance bears to many highly valued antiseptics, there seems good reason for its extensive use, especially in connection with the fact that it is dissolved in 15 per cent. alcohol.

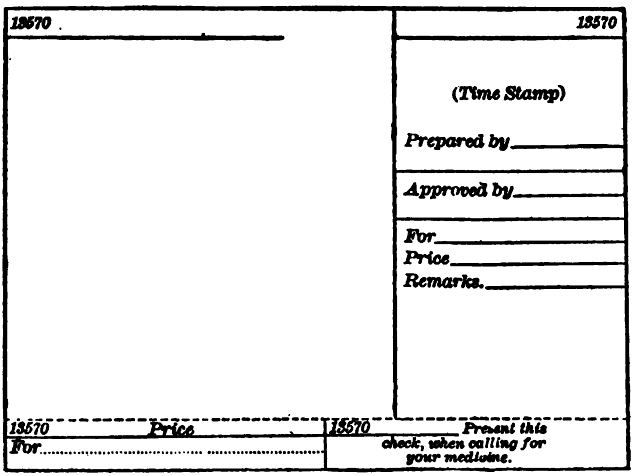
Cleveland, O., July 27, 1897.

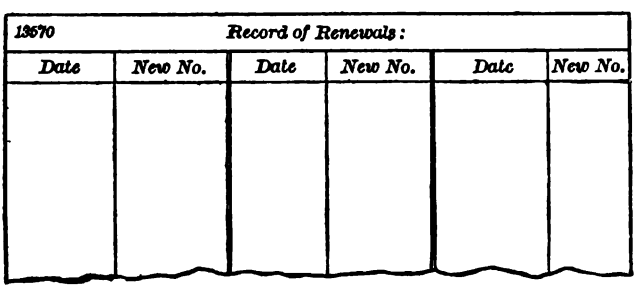
PRESCRIPTION FILING.

BY WILLIAM C. ALPERS.

A system of filing prescriptions which I have successfully adopted in my pharmacy is the adaptation of the so-called Card-Library Index. It has great advantages over other systems, and requires neither more work nor more expense.

Each prescription is pasted on a thin, white pasteboard card, prepared with proper ruling and inscription for this purpose, as shown in the illustration below. The cards are 8 inches wide and 7½ inches long, and have a perforated line one inch from the lower end, so that after the inch-strip is removed the remaining size is 8 by 6½ inches. They could, of course, be made any convenient size. A second perforation divides the detachable strip into two equal parts. On each of these





small parts, as well as on the main card, appears the running number of the card, which is also the running number of the prescription. The right small strip bears the inscription: "Present this check when calling for your prescription," and has a blank space for the price. The left small strip also has a space for the price, and another for the name of the customer.

The main card is divided by a vertical line into two parts, 3 and 5 inches wide, respectively. The larger left-hand part is ruled and has no further inscription. On the smaller right-hand part there is a blank space immediately under the running number about 1½ inches long, and under it, on successive lines, are the words:

Prepared by ....
Approved by ....
Price ....
For ....
Remarks ....

leaving, finally, another blank space of more than two inches.

The back of the card bears the heading: "Record of Renewals," and is divided into three even spaces, each one having two blank columns with the heading: "Date" and "New Number."

When a prescription is presented the small strip at the right lower side is detached and handed to the customer as a check, to be returned when the prescription is ready. In case the customer wishes to have the medicine delivered at his house, the messenger from the pharmacy must ask for this check and bring it back. It is kept for a reasonable time, and serves as evidence that the medicine has been delivered at the right place, and also as a receipt from the customer.

The next step is to put a time-stamp on the main card in the space immediately under the running number. This stamp shows the day, hour and minute, and is impressed by a so-called "time-stamp machine," in which the stamp moves every minute with the hands of the clock. The prescription is then pasted on the larger blank space of the card, and the latter handed to the prescription clerk, who then proceeds to prepare it. If a customer asks for a copy he receives it without argument; if, however, he wishes to retain the original, the prescription is copied on the card and the original returned. In both cases—whether the copy is delivered to the customer or kept in the pharmacy—a stamp is put on it, reading: "Copy of prescription No. . . , copied by . . . . , approved by . . . . , date . . . . . ." The date, showing day, hour and minute, is again printed by the time-stamp. Proper entries are made in the blank spaces of the stamp by the clerk who copies the prescription, and by a second clerk who checks it as correct. The prescription is then prepared, and afterwards checked by a second clerk. To do this properly, all weights and measures are put before the container from which the respective article is taken. For instance, the prescription may read:

Quin. Sulph ....ʒ ii.
Acid. Sulph. Arom ....fl. ʒ ii.
Strych. Sulph..gr. i.
Liq. Pot. Arsen ....fl. ʒ iv.
Syr. Zingib., q. s. ad...℥ viii.

Two drachms of quinine sulphate are weighed and the two-drachm weight put before the bottle from which the quinine was taken; the same is done with the one-grain weight after the strychnine sulphate has been

weighed. These weights must not be used again for the same prescription—even if the same quantities of some other article are wanted. In the same way two fluid drachms of aromatic sulphuric acid and half a fluid ounce of Fowler's solution are measured and put before the bottles from which they are taken, using a clean graduate for each liquid. Before the ingredients are mixed, a second clerk is called to verify all articles, weights and measures. The clerk who verified the prescription enters his name or initials on the line marked: "Approved by . . . ." The price is entered on the next line, and also on the remaining lower narrow strip, the name of the customer, if known, on the following line, and also on the detachable strip.

Any difficulties or peculiarities that were encountered are entered under "Remarks," such as the size of the capsules, the coating of pills, excipients used, etc. Finally, another stamp is put on the lower blank space of the card, and the check clerk examines the finished product a second time. After wrapping the box or bottle, the small strip at the left lower end of the card is taken off and attached to the package as a means of identification.

Renewals are treated like new prescriptions. A new card with the running number is taken, and on the left side the entry is made: "Renewal of No. . . . , Dr. . . . . . , Date . . . . , . . . , all the other entries being made as for a new prescription. The card with the original prescription is endorsed on the back, giving the date and number of the renewal. The label of the container shows both numbers, for instance, No. 2376, renewal of No. 1587, the old number being written in red, the new ones in black ink.

The cards are kept in a cabinet of drawers, but the ordinary drawers in any pharmacy would answer the same purpose, providing both cards and drawers were made of corresponding size. A drawer will hold about 1000 cards, and index-cards may be put up at intervals of fifty cards to facilitate the finding of any particular number. Old prescriptions, which are not likely to be renewed—or only at great intervals—may also be stored in packing boxes in a convenient, out-of-the-way place.

It will be seen that by this system the full record and history of a prescription is kept on the original card—the time when it was presented, when it was ready for delivery, the names of the clerks who prepared and checked it, the difficulties encountered in its preparation, the price and the owner's name, and the number and date of repetitions. The renewal-cards also show the names of the dispensers, and all other entries.

This record-card is quickly found, and can be shown and handled without disturbing any other part of the file.

SULPHUR PRÆCIPITATUM.

T. D. REED, M. D.

Query 24. Precipitated sulphur seems to be grossly adulterated. Is it possible to obtain it pure in the open market?

This query is somewhat ambiguous, and its meaning must be assumed. In the first place the expression "grossly adulterated" may be taken as the equivalent of "not up to the standard of the Pharmacopœia."

The processes of manufacture of the British Pharmacopœia and United States Pharmacopœia are similar, up to the point of the addition of hydrochloric acid. The U. S. P. requires the acidulation to be stopped while the calcareous solution is still alkaline. The B. Phar. allows the addition of acid up to slight acidity; the product in the former case being greenish-yellow, in the latter almost white.

In the quantities used the resulting compound in solution is CaS_4; as, however, this tetrasulphide is not well known, text-book writers assume that the combination is $(CaS_5)_2+CaS_2O_3$. This assumption is plausible, but the equation given in some text-books, as representing the result of the pharmacopœial process $=(CaS_2)_2+CaS_2O_3$, is *not* tenable, as in it less than half of the sulphur is accounted for.

The product known as "Lac Sulphur," was formerly official, and from recent inquiries made is still extensively sold, and frequently dispensed for sulphur præcipitatum. This product, the result of a former pharmacopœial process, in which sulphuric acid is used as the precipitant, contains the whole of the calcium that was in the solution, containing in the finished product 58 per cent.—as gypsum—$CaSO_4$ being practically insoluble.

This undesirable mixture, though not to be classified as wilful adulteration, clearly comes under the legal classification of "sophistication" or "adulteration" and "not according to the Pharmacopœia." It is in reference to this mixture, doubtless, that this query is framed.

The second sentence of the query, "Is it possible to obtain it pure in the open market?", is susceptible of answers in two directions. It may be answered in the matter of the pharmacist, as a buyer from the wholesaler, or in the matter of the public buying from the retail pharmacist. An answer is attempted to meet each supposition.

That the pharmacist may procure a proper article of sulphur præcipitatum in the large commercial centers is evident, for pure samples were obtained from wholesalers in Montreal, New York and Philadelphia.

The retail drug trade of the Province of Quebec gets its supplies almost entirely from seven large houses in Montreal. The stocks of these were examined: Two had both the calcareous and pure in stock, three had only the impure, one only the pure, and one "hadn't any in stock" at the time of inquiry.

Investigation of retail stocks was then made. Samples were obtained from 55 reputable pharmacies in Montreal, Brooklyn, Baltimore, New York, St. Louis and Chicago. 26 of these were pure, 29 were calcareous.

SAMPLES OF SULPHUR PRÆCIPITATUM.

	Montreal.	Brooklyn.	Baltimore.	New York.	Chicago.	Hospitals. Montreal.
Pure	6	1	6	9	....	1
Calcareous	14	1	1	.....	7	1

Total samples examined: 55.

In Montreal it was generally stated that the article was in small demand, a pound serving for several years in some cases. It was also held that occasionally preference was expressed for the "sparkling" powder when "lac sulphur" was wanted.

The willingness of the public to accept an impure article, the result of early experience, is, however, no excuse for the pharmacist carrying only the impure article in stock. In buying, the pharmacist should specify: Sulphur præcipitatum pur., and examine every lot with a lens. All that is necessary is to rub a little smooth on paper, with a spatula, and examine with good light. Any sample showing shining particles with a lens, or even to the naked eye, is to be rejected. It is not really necessary for the buyer to estimate the quantity of calcareous matter. In the cases in which the quantitative estimate was made, the lime was "all there." For the U. S. P. article the simplest method is to extract with carbon disulphide and weigh residue as impurity. For the B. P. article, which may contain some gamma sulphur, I prefer to extract the sample with water, dry and weigh residue, burn this and deduct ash (sand, etc.).

To make anything like a survey of the stocks throughout the United States would be a work of time, labor and expense: this answer could only be taken "*pro tanto*," but may serve, by the publicity given the subject through the American Pharmaceutical Association, to call the attention of pharmacists to the desirability of every retailer overhauling his stock of "sulphur præcipitatum."

I am indebted to Messrs. Alpers, Caspari, Bacon, Gallagher, Whelpley and Hallberg for obtaining for me, samples for tabulation.

Montreal, July 24, 1897.

MEDICINES OF THE SWAMPY CREE INDIANS OF THE NORTH.

BY C. FLEXON, WINNEPEG, CAN.

At a late hour, during the close of last week, a most interesting gentleman, a stranger to me, hearing that I had been appointed a delegate to this meeting, called to see if a brief record of his experience among the Swampy Indians of the North, with whom he had lived for six years, would be acceptable to me. I thanked Mr. Strath, for such is his name, and he thereupon furnished the following particulars of some of the drugs prescribed by him in his capacity of medical officer at Norway House, about 400 miles due north of Winnipeg. The conversation which I had with him was unfortunately but too short, as it was extremely fascinating. He has evidently been a close observer of those people. Apart from speaking their language fluently, I should say a pretty accurate knowledge has been gained by him of the strength and weakness of the Cree mind. As a Greek and Hebrew student, he has a remarkably high opinion of the Cree language. For beauty and perfection he says it cannot be surpassed, and to hear him talk of the poetry and eloquence of some of the native sermons which he has heard has completely destroyed my confidence in the language which we are indulging in on this occasion, and which we are conceited enongh to suppose is the best in the world. A large number of the diseases common to the white people are just as common among the Indians, and while many of the drugs used by them are well known to us, the manner of using them is certainly different. In the treatment of worms for instance, male shield fern, or the aspidium of the U. S. Pharmacopœia, or the filix mas of the British, is given as a strong infusion combined with senna and wild indigo. The latter article by the way is used as an antiseptic, and has excellent drying properties in the treatment of eczema humidum or weeping eczema. One of the commonest drugs with them, and which is to be seen hanging up to dry in every wigwam or tepee, is the wekâs or sweet flag—the calamus of the Pharmacopœia. It is considered a specific in all throat troubles, with the exception of diphtheria, which is unknown to them. In cases of pharyngitis and tonsilitis it is used externally and internally. The rhizome is chewed and the saliva allowed to wash the throat. Poultices are made by mixing the powder with boiling water. It is a curious fact that the Indians are not only ignorant of gargles, but of the act of gargling, and Mr. Strath has been amused time and again in his effort to get a Cree to gargle. This drug is carried about by the natives in the winter time as a tonic, and because of its stimulating properties is chewed by the Indian as tobacco is chewed by the white, or should we say more correctly the civilized man. Most of their medicines are in the form of infusions. Very little is known about the salts, and it was with the greatest difficulty that the officer could persuade a patient to take Epsom salt, in consequence of a deep-rooted

superstition that magnesium sulphate will produce inflammation of the bowels. Pills no matter how strong are swallowed ad libitum. Podophyllum peltatum or mandrake is taken in doses of 20 grains. Carui fructus or the common caraway is indigenous to that country and is the common remedy for colic, a complaint perhaps more frequent and more stubborn than with us.

Another indigenous plant and which grows in that latitude in great profusion is the caulophyllum or the blue cohosh, and also known by the names pappoose root, squaw root, blueberry root. It is used very largely in obstetrics and in all female complaints. In doses of 30 to 60 grains the powdered rhizome is given to produce abortion; but the Crees have a powder which they mix with the cohosh, and when thus administered Mr. Strath has known more than one instance where a three-months fœtus has been expelled from the uterus without ensuing danger to the mother. He even goes so far as to say that abortion procured in this manner precludes all possibility of future conception. This powder they never allowed Mr. Strath to see, and in spite of his offer of fifty dollars for a small sample, the secret has been kept profoundly sacred. Menstruation at eleven is the rule, and he considers it a remarkable fact in a cold country where the thermometer often registers 50° below zero.

Ladies' slipper, the cypripedium of the Pharmacopœia and imported from tribes to the South, is chiefly used in rheumatism in very large doses. It is also used in the treatment of epilepsy; but this disease is of rare occurrence.

As an aromatic stimulant, hedeoma, or pennyroyal, is as much used by the Cree women, and in a similar manner, as by our own people.

Plantago, or plantain, is used commonly as a hæmostatic, and is chewed by the doctor and applied as a paste to the bleeding surface. This drug is their remedy for toothache. It is not put in the aching tooth, but is swallowed. Some of you will be surprised to hear that the Indians suffer very much from their teeth, and that my informant has practiced a great deal of dentistry during his residence with them.

Juniper is used in three forms. The berries are stewed and eaten as a diuretic. The leaves are dried and dusted over indolent sores, healing them with wonderful rapidity, and the root infused is administered in cases of gravel. Though Bright's disease is rare, gravel is very common, and most of the old men die of it. Hydrangea is used with juniper, and with great success.

Spearmint, sarsaparilla and dandelion are taken for the same complaints as we ourselves take them.

Hemlock spruce is much thought of, the inner bark of which freshly peeled is mixed with equal parts of poplar and black birch to make a decoction. In the process of boiling, an oil is taken from the surface. This oil is mixed in the proportion of 2 drachms to a quart of water, which

quantity is drank in the course of two or three days, as an abortive medicine.

We must no longer pride ourselves over the nursery toilet powders which we present to our customers in such a variety of charming packages. To the Indian, whose untutored mind, as Pope says, sees God in clouds and hears Him in the wind, must we go for the most agreeable and most absorbent article of the kind yet introduced, a sample of which I have with me. It is nothing but the rotten interior of the hemlock spruce, lacking perhaps the extreme fineness which could only be obtained by modern methods.

We now come to willow bark, which is used as a hæmostatic in the form of infusion. It is the belief of the Indian that bleeding should be arrested at once. He has an awful fear of death from loss of blood, and an Indian has been seen to faint whilst watching another have his finger amputated.

Regarding salicin, "the important constituent of willow bark," the Cree is incredulous as to its source. He cannot understand how a white powder can be made from a bark, and it is entirely without faith that he is occasionally induced to take either this remedy or the salicylates for rheumatism.

The belief that fever can only be cured by vomiting it up has a strong hold of the Cree mind, and he therefore swallows the strongest remedy by taking what we would consider more than a maximum dose of veratrum viride, or green hellebore of the Pharmacopœia; but this powerful drug has another use, the story of which, to some of the gentlemen present, will to say the least be news. The rootlets and the rhizome are powdered between two stones, and as such is taken as snuff to reduce hernia. The modus operandi is thus: the patient is elevated to a horizontal position (naked of course). He then takes a good pinch of snuff, and during the violent sneezing which follows, a companion standing ready at the side plunges back the rupture with his fist, and if it be not a strangulated case the treatment is sufficient. To undo matters, so to speak, the patient is advised to eat all the pork he can. Mr. Strath is of the opinion that hernia is common with the tribes in consequence of the abundance of grease consumed by them, and he ventured to say that eight out of ten Crees are ruptured.

Skin diseases of all kinds are there, and are treated with an ointment made of equal quantities of gunpowder and lard.

Sturgeon oil is used in the place of cod-liver oil, and is clarified till it becomes the color of tincture of capsicum. In one-ounce doses, which are considered large, it acts as a cathartic.

An infusion of wild raspberry leaves combined with willow bark is an excellent remedy for cholera infantum, if promptly administered; but there are a great many deaths from diarrhœa. In that latitude, and in all degrees north of 54, a very large raspberry grows which is called the head-

berry by the Indians, but the botanical name of which is Rubus arcticus. The berry is found at the head of a stem 2 feet in height.

Rumex or yellow dock is well known and used extensively as a laxative and for poultices.

In any critical case of illness, the medicine man of the tribe is called in, and is required to say whether or not the patient will recover. This skillful fakir has a powder resembling pulverized rhei in appearance, which he places on the surface of a saucerful of water. The powder in a moment or two spreads out into rays either to the east or to the west. If to the former point of the compass, the victim will die. If to the latter, which invariably happens, recovery is promised. It is quite likely that a promise of such a nature materially helps the patient by buoying him up, and by inspiring him with hope. So much for one feature of Indian superstition.

Indian revenge, or that of the northern Crees in particular, is, if true, of the most shocking character. It is said that if a Cree wishes to punish another severely, he does so by disfiguring him for life by introducing an almost tasteless compound into his tea or tobacco—generally into his tea, which he drinks strong, and in large quantities. This vile compound is made up of twenty-seven vegetable and animal drugs. The victim feels no ill effects at the time of taking it; but in the course of two or three months the skin begins to peel, a rash breaks out and spreads over the entire body. Subsequently the skin gradually darkens to black, and on the exposed parts hair grows so thickly as to give the unhappy Indian the appearance of a baboon, from which he never recovers. There is no romance about this, I am assured, for there are at least half a dozen cases of the kind to be found in that country at this day.

Their most fatal poison is the wild carrot. These Indians have a fashion of boasting among themselves of their ability of poisoning enemies at various distances. Just imagine an Indian polishing off an enemy at a distance of five miles by a wild carrot.

THE EFFECT OF TEMPERATURE UPON PERCOLATION.

BY H. DE FORREST SMITH.

The purpose of investigating this subject was to find out if a product obtained by percolation at as low a temperature as possible, differed in any respect from a product obtained by percolation at ordinary temperatures.

The subject arose out of an incident which occurred in the Pharmaceutical Laboratory of the Massachusetts College of Pharmacy during the winter of 1895–96.

Among the pharmaceutical products which the students have to prepare and standardize is extract of nux vomica. Some of the students prepared this during excessively cold weather, and their extract was lighter in color, and of higher alkaloidal strength than the extract of the other students prepared under the ordinary conditions of temperature. Drugs

may contain, besides their active principles, much medicinally inert matter, as gum, sugar, mucilage, pectin, starch, albumen, color, fixed oils and rubber. Some of these bodies being soluble in the menstruum used to dissolve the active principles of the drug, would, if in variable proportions in the finished product, alter its character. There being no literature upon the subject, no one could satisfactorily explain the difference between the two products, unless temperature did modify in some way the percolation process.

The drugs chosen for the investigation of this subject were opium, nux vomica, cinchona, conium, stramonium and belladonna, as definite and accurate methods of assay were applicable to both the crude drugs and their products, and also afforded a variety in menstrua. The drugs gave the following assay results:

Opium	13.97	per cent.	morphine.	
Nux vomica	3.2	"	total alkaloids.	
Cinchona	8.8	"	"	"
Stramonium	0.38	"	"	"
Conium	0.54	"	"	"
Belladonna	0.4	"	"	"

Opium and nux vomica were assayed according to the United States Pharmacopœia of 1890: cinchona was assayed according to the following method used at the Massachusetts College of Pharmacy:

Cinchona, very fine powder and dried at 100° C.	10 Gm.
28 per cent. Ammonia Water	3 Cc.
91 per cent. Alcohol	7 Cc.
Chloroform	30 Cc.
Ether, a sufficient quantity to make	100 Cc.

Place powder in dry flask, add above menstruum and macerate twenty-four hours, frequently shaking, carefully decant 50 Cc. (representing 5 grammes of drug) through a rapidly-acting filter into a separator flask, avoiding loss by evaporation. Dissolve out the alkaloids by adding successive portions of 5 per cent. solution sulphuric acid, using about 15 Cc. each time until no precipitate is obtained with Mayer's reagent. Then follow the United States Pharmacopœia 1890, by adding a slight excess of potassium hydrate to precipitate the alkaloids. Extract the alkaloids with successive portions of chloroform, testing with Mayer's reagent. Dry the united chloroformic extract at 100° C. and weigh.

Stramonium and belladonna were assayed as follows:

Drug in fine powder	10 Gm.
28 per cent. Ammonia Water	1 Cc.
91 per cent. Alcohol	9 Cc.
Ether, a sufficient quantity to make	100 Cc.

Place the powder in a flask, add the menstruum and macerate three hours, frequently shaking. Decant 50 Cc. (representing 5 Gm. drug) through a rapidly-acting filter into a separator flask. Extract the alkaloids with successive portions of 5 per cent. sulphuric acid solution, using about 15 Cc. each time until no precipitate is obtained with Mayer's reagent. Neutralize the acid solution with 10 per cent. ammonia water, and then just add enough excess to precipitate all the alkaloids, again testing with Mayer's reagent. Extract the alkaloids with successive portions of ether, distil off the ether and dry to constant weight at a temperature not exceeding 50° C., and weigh.

The assay process for conium differed from above only by this modification: Hydrochloric acid gas was passed through the etherial solution of the alkaloids, to fix the volatile alkaloid coniine by changing it to a salt, so the subsequent drying of it at 50° C. would not decompose it. As it was weighed as a salt of coniine, this must be taken into consideration upon computing the per cent. of alkaloids.

These preparations were made from the drugs by strictly following the United States Pharmacopœia, 1890, processes as indicated for each: Deodorized tincture opium, extract nux vomica, fluid extract cinchona, fluid extract stramonium, fluid extract conium and alcoholic extract belladonna leaves. 400 grams of each drug were properly powdered, moistened, macerated and percolated in long cylindrical percolators by menstrua whose alcoholic strength was assured by specific gravity tests. As drugs like nux vomica require a larger amount of menstruum to thoroughly exhaust them than is used in practice, I percolated each to the same degree of exhaustion, by comparing the turbidity produced by one drop of percolate with one drop Mayer's solution and 10 Cc. water, with a standard made by adding a minute quantity of precipitated calcium phosphate to 10 Cc. water, just enough to give a slight turbidity when shaken.

The percolations were carried on in a room heated quite uniformly to about 22° C. The rate of flow was regulated by valves to about 5 drops a minute, excepting opium, which would not run faster than 2 drops a minute.

For experiment upon the effects of a low temperature upon percolation, advantage was taken of the cold winter weather by placing the percolators in an open basement. As temperatures of winter fluctuate, the thermometer was closely watched and all percolations stopped when the temperature rose too high. All the drugs were carefully prepared and manipulated in precisely the same manner as for the other process, and placed for maceration in the cold basement at an average temperature of —10° C. They were ready for percolation when the temperature was about —15° C, excepting opium, which having an aqueous menstruum, was percolated at an average of +5° C. I found cinchona would not run until the temperature had risen to above —3° C, and even then would yield only a drop in about 10 minutes. Belladonna and conium would percolate at a temper-

ature only above $-6°$ C., and even then very slowly. As soon as the temperature rose to $0°$ C. the percolations were stopped to confine them to as low a degree as possible. The percolations for these three drugs lasted about four weeks.

Stramonium would not percolate below $+3°$ C. and above $+3°$ C. only very slowly. This process lasted about 10 days. Nux vomica percolated readily at all temperatures, even as low as $-15°$ C., the coldest day of the year. Opium percolated at from $+5°$ C. to $+10°$ C., about one drop a minute.

The appearance of these percolates was quite characteristic, as compared with those of the other process. The cinchona percolated about one drop in 10 minutes, and these drops were in the form of large crystalline clots of purple-red color. The first reserve and lower layer of weaker percolate retained this character while in the cold, but it disappeared when exposed to ordinary temperatures.

The stramonium, conium and belladonna percolates were very turbid while in the cold, but the turbidity was decreased when exposed to ordinary temperatures. The nux vomica percolate came through very light in color, but was perfectly clear under all conditions of temperature. Opium did not differ in any way from that of the other process.

There was practically no difference between the two processes in the amount of menstruum necessary to exhaust them to the same degree, as is shown by the following table:

	Ordinary.	Cold.
Deodorized Tincture Opium	2000 Cc.	2000 Cc.
Extract Nux Vomica	1540 "	1625 "
Fluid Extract Cinchona	1000 "	1000 "
" " Stramonium	1200 "	1200 "
" " Conium	1380 "	1400 "
Alcoholic Extract Belladonna	1050 "	1025 "

I found that there was a great difference between the two processes in regard to the amount or percentage of extractive matter, in that the *cold percolation process does lessen the amount of extractive matter* in the finished product. My results were as follows:

	Per cent. extractive by ordinary process.	Per cent. extractive by cold process.	Difference.
Deodorized Tincture Opium	7.12 per cent.	7.02 per cent.	.1 per cent.
Extract Nux Vomica	11.11 "	8.75 "	2.36 "
Fluid Extract Cinchona	43.49 "	33.61 "	9.88 "
" " Stramonium	5.78 "	3.18 "	2.6 "
" " Conium	31.1 "	25.6 "	5.5 "
Alcoholic Extract Belladonna	27.82 "	24.77 "	3.05 "

The following is the assay of the finished products:

	Ordinary process.	Cold process.
Deodorized Tincture Opium	13.917 per cent.	13.901 per cent.
Extract Nux Vomica	15. "	15. "
Fluid Extract Cinchona	8.67 "	8.74 "
" " Stramonium	.35 "	.301 "
" " Conium	.52 "	.51 "
Alcoholic Extract Belladonna	1.684 "	1.86 "

Deodorized tincture opium and extract of nux uomica were assayed according to U. S. P., 1890, excepting, instead of estimating amount of water in extract nux vomica, it was dried to constant weight at 100° C., and, after assaying, enough well-dried sugar of milk was added to bring the total alkaloid to 15 per cent.

Fluid extract cinchona was assayed as follows:

Fluid Extract Cinchona	10 Cc.
28 per cent. Ammonia Water	3 Cc.
Chloroform	30 Cc.
91 per cent. Alcohol	7 Cc.
Ether q. s. ad	100 Cc.

Evaporate the fluid extract to dryness, add the above menstruum and macerate 24 hours, frequently shaking. Decant 50 Cc. through a filter (representing 5 Cc. drug) into a separator flask. Dissolve out the alkaloids with successive portions of 5 per cent. sulphuric acid solution, using about 15 Cc. each time, until no precipitate is obtained with Mayer's reagent. Neutralize the acid solution of alkaloids with potassium-hydrate solution, and then just add enough in excess to precipitate the alkaloids. Extract the alkaloids with successive portions of chloroform, dry the united chloroformic extracts to constant at 100° C. and weigh.

Fluid extract of stramonium was assayed as follows:

Fluid Extract Stramoniun	10 Cc.
28 per cent. Ammonia Water	1 Cc.
Alcohol	9 Cc.
Ether. ad. q. s.	100 Cc.

Evaporate the fluid extract to dryness at a temperature not exceeding 50° C., and add the above menstruum and macerate three hours, frequently shaking, carefully decant 50 Cc. (representing 5 grammes original drug), through a rapidly-acting filter, into a separator flask. Dissolve out the alkaloids by adding successive portions of 5 per cent. sulphuric acid solution. Neutralize the acid solution of alkaloids with sufficient 10 per cent. ammonia water, and then add just enough in excess to precipitate all

the alkaloids. Extract all the alkaloids by using successive portions of ether, and distill off the ether and dry the residue at a temperature not exceeding 50° C., and weigh. Extract of belladonna was assayed by same process, only 10 grammes were weighed out instead of using 10 Cc.

Fluid extract of conium was also assayed by same process, except that hydrochloric acid gas was passed through the etherial solution of the alkaloid to change it to a salt—in the same way as for the assay of the original drug.

Several weeks have passed since the above experiments were made, and now a comparison can be formed between the products as to their color, density, clearness, and general attractiveness.

There is apparently no difference between the deodorized tinctures of opium. The extract of nux vomica made in the cold having less extractive matter, was stronger in alkaloids, and is lighter in color, as a larger proportion of sugar of milk was added to bring total alkaloids to 15 per cent.

Fluid extract cinchona by cold process is lighter in color, less dense, but has a larger precipitate than the other. The fluid extract made at ordinary temperatures has an oily flocculent precipitate remaining upon sides of container when a part is poured off, otherwise the fluid extract is clear and bright.

Fluid extract stramonium made at ordinary temperatures is dense, of a darker color, is always turbid, but has less precipitate than that made in the cold. The latter, although having a larger precipitate, is not turbid, the supernatant liquid remaining clear.

Fluid extract conium made at ordinary temperature is more dense, darker in color, very turbid, and has about the same amount of precipitate as the extract made in the cold. The latter is not turbid, but has an oily precipitate in form of ring around neck of container.

There is apparently no difference in appearance between the two alcoholic extracts of belladonna leaves, except the assay shows the cold percolation product to be very much stronger, as it had a smaller per cent. of extractive matter.

From these experiments I believe the cold percolation process offers no practical advantage to a pharmacist over the process of percolation at ordinary temperature. Of the six drugs I experimented upon, I believe those made in the cold were superior; but excepting the process for nux vomica alone, the slowness of the cold percolation process upon the other five drugs would render it entirely unsuited to a pharmacist. Besides, if artificial means were necessary for these processes, the cost would not be compensated by their improved appearance.

Cold percolation does greatly lessen the per cent. of extractive, and tends to render the products lighter in color, less dense, and of a clearer and more attractive appearance.

SELENIUM IN COMMERCIAL SULPHUR.

BY T. D. REED, M. D.

Answer to Query 25. To what extent is Selenium found in "Flowers of Sulphur"?

This query is somewhat indefinite, to the "extent" that the "extent" may be taken as the equivalent of "quantity" or "frequency."

The sulphur coming into Canada is wholly from the Mediterranean, and known in trade as Sicily sulphur. Six samples, from as many different dealers, were examined by the cyanide process of U. S. P., all failed to give coloration within the limitations. Two samples of American sulphur, authenticated by Mr. Remington, were tested and also failed to give any indication of selenium.

To test the U. S. P. process and also to obtain a colorimetric standard, a sample of fused selenium, Merck, was obtained and treated with cyanide according to the official process. The test was found to be delicate and available to $\frac{1}{500}$ of a grain. This test depends on the formation of seleno-cyanide of potassium, and the precipitation from the solution of red selenium on the addition of hydrochloric acid. To make a more thorough test, double the quantity of the pharmacopœial test, 1 gramme, was taken and the quantity of cyanide increased to two grammes; the boiling was continued one hour, some of the sulphur was still undissolved; a further addition of cyanide (Merck's 98 per cent.) of half a gramme was then made, and the boiling continued half an hour. A few particles of sulphur still remained undissolved. On cooling, the clear liquid was strongly acidulated with hydrochloric acid, C. P., but no trace of selenium was obtained. The reason for increasing the quantity of cyanide was a desire to dissolve the whole of the sulphur, if possible, into sulpho-cyanide—the quantities being practically 2 to 1. thus: $KCN = 65, S = 32$.

The U. S. P. test is as follows: "If .5 gram of sulphur be boiled with .5 gram potassium cyanide, in 5 $cm.^3$ of water, and the clear liquid be acidulated with hydrochloric acid, it should not assume a reddish color, even after standing for an hour" (absence of *selenium*).

On boiling the cyanide and sulphur together, in pure water, a colorless solution is obtained; on the addition of hydrochloric acid, slight effervesence occurs and a faint yellow cloud appears; this is due to persulphocyanic acid.

The operator must be on his guard against iron, as the sulpho-cyanide is extremely sensitive to this metal, and iron is an element very difficult to completely get away from. In some of the experiments made a red color was promptly obtained; this reaction was finally traced, in one case, to the filter paper, in another, to dust, and the sulphur also was found to give faint traces of iron.

The answer that I feel disposed to make to the query, admittedly an incomplete one, is:

There is no difficulty in obtaining sulphur which will meet the requirements of the U. S. P. in the absence of selenium.

In preparing this communication some facts have been learned which it may be permitted here to state. The nomenclature, "flowers" vs. "flour," has been discussed. "Flowers" is the term quite properly applied to substances like sublimed sulphur, as indicated by the Latin and German equivalent. In commerce much of the "powder" of sulphur is ground lump, and to this the term "flour" would apply.

For disinfection and agricultural purposes, dealers send out the ground, as it is a little cheaper than the sublimed. The lighter tint of the ground is noticeable when the two are compared.

A curious mis-print was noticed in the U. S. P. Under Sulphur, the statement is made: "Carbon disulphide dissolves a portion of it, but leaves a residue of *crystalline* sulphur." It should read *amorphous*. The various crystalline forms of sulphur are all soluble in CS_2, only the gamma or amorphous sulphur is insoluble. The attention of the text-book writers who have reproduced, only too carefully, the wording of the national authority, is respectfully called to the statement in this paragraph.

The coloring power of precipitated selenium is very great, one grain making a pint of water look like arterial blood. The tint also is to be noted, as different from that of sulphocyanide of iron.

Chicashige describes in *Chemical News*, April, 1897, a red sulphur occurring in Japan and containing $\frac{1}{16}$ per cent. of selenium. This fact is here noted, to allow the remark that even in the case of a native sulphur, sufficiently rich in selenium to be distinguishable at sight, the quantity present —less than 5 grains per pound—might well be considered therapeutically negligible.

The spectroscope was tried, but did not furnish any aid in the recognition of selenium.

Montreal, July 30, 1897.

THE TOXIC ACTION OF PHENOLS ON LIVING PLANTS.

BY R. H. TRUE, PH. D. AND CARL G. HUNKEL,* B. S.

In these days, when science is reaching out in every direction and exploring hitherto unentered fields, many interesting discoveries are being made along the boundary lines, in those border regions between the different sciences. As one science improves its methods and implements of research, the others gain thereby new methods and tools as well.

A conspicuous example of this is to be seen in the recent activity along the lines of physical chemistry. The nature and properties of solutions are problems that have led to results of the utmost importance not only to chemistry but also to biology. The study of these questions, involving

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especially the osmotic properties of solutions, their raising of the boiling point and lowering of the freezing point, and their electrical conductivity, has given us the Arrhenius theory of the dissociation of electrolytes in dilute solutions.

According to this theory, the molecules of electrolytes, when dissolved, split up into radicles or ions, which are charged with electricity. Each molecule typically breaks up into two ions, one, the basic radicle, charged with positive electricity, and the other, the acid radicle, charged with negative electricity. In a solution there is an equal number of ions of each kind and therefore a like number of opposite electrical charges. Thus an electrical neutrality is maintained in the solution. Dissociation is incomplete in concentrated solutions, there existing not only a like number of ions of either sort, but also a residue of undissociated molecules. As the dilution increases an increasingly large number of molecules split up, until complete dissociation is approximated or until the maximum of dissociation is reached. Theoretically dissociation is incomplete short of an infinite dilution, but in strong acids and bases and their salts it is assumed to be essentially complete when a gram-molecule of the substances, *i. e.*, the molecular weight in grams, is dissolved in 1000 liters.

It has been found that the chemical and physical properties of solutions depend to a very large degree on their dissociation, *i. e.*, on the form in which the substances exist in the solution as well as on the nature of the substances themselves present. Various scattered instances cited in the literature of the biological sciences strengthen the *a priori* supposition that the action of solutions on plants and animals might likewise depend to a great degree on the form as well as the nature of the substances present—otherwise stated, on the electrolytic dissociation of the substances dissolved.

As far as the writer's knowledge goes, the first attempt to use this theory as a means of explaining the action of solutions of acids, bases and salts on living things, and to test, by a large number of experiments directed toward that end, the extent to which this explanation might be applied, was made by Kahlenberg and True,* in 1896. It was found that only when solutions are made up on the basis of chemical equivalents instead of percentages, do the true relations appear. It was found that for bases, acids and salts the condition in which these substances exist in the solution determines, usually, in a very large degree, their action on the plants. It was found, in short, that this explanation reveals a thread of reasonableness running through the hitherto unorganized phenomena observed in the study of these classes of substances as medicinal remedies, as fungicides and as antiseptics.

While in many instances the factor of dissociation does not satisfactorily

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* Botanical Gazette, 22, p. 81 (1896); Jour. Am. Med. Asso., July 18, 1896.

account for all phenomena, it seems to furnish a means for rationally interpreting a very large body of observations, otherwise, as yet, incapable of as satisfactory an explanation. In the endeavor to extend our knowledge of the poisonous action of that class of substances known as phenols, on plants, the authors of this paper have during the past year made a large number of experiments. Our problem has been to test the action, during short periods of time, of phenols of various composition on widely-separated representatives of the vegetable kingdom. Radicles of the white lupine, *Lupinus albus*, L., and the filaments of *Spirogyra* sp. were used as subjects of study.

Seedlings of the lupine were provided with a mark of India ink, 15 millimeters from the tip, and placed in the desired solutions. After from 18 to 24 hours they were measured and the intervening growth indicated. The appearance was also noted; if there was any question as to whether they were alive or dead, they were replaced in the solution for another day and the growth at the end of that period again noted. A comparison of these data afforded a reliable basis for conclusions as to the condition of the root. The solutions, in terms of molecular equivalents, were made up in such strengths that results easy of comparison were obtained. In obtaining the next weakest strength, solutions were always diluted to one-half the given concentration. The object of the experiment was to find the first concentration in which the radicles could live.

Spirogyra was also used in some substances; small masses of the filaments were washed in a part of the solution in which they were to be placed, this being done to prevent a dilution of the same. The degree of dilution in which the cells lived and died in equal ratio was regarded as the boundary for the Algæ. In this way, it was possible to find a degree of dilution which could be regarded as expressing the toxic value of the given substance for the plants under study. This value we have expressed as a ratio in which the strength of the solution is indicated. The numerator, one, is always one gram-molecule; that is, the molecular weight of the compound in grams; the denominator indicates the number of liters in which this amount of the substance would be dissolved to give a solution representing the critical strength.

In general, the phenols acted with less sharpness and precision than the inorganic compounds, and conclusions were frequently difficult to draw, owing to the individual differences of the plants under study.

An investigation of the phenols, by Richard Bader,* from the standpoint of physical chemistry, has shown that electrolytic dissociation of the molecules takes place normally to a very slight degree. We are, therefore, except in certain cases, obliged to attribute the toxic action of this group of compounds to the undissociated molecules.

* Zeitschr. f. physik. Chemie, vi., 289.

A series of very interesting questions arose in regard to the relation existing between the molecular construction and the action of these substances. These will be further referred to in the course of the paper.

In order to bring together for ready comparison the results obtained, the details of the experiments are omitted; only the toxic values of the various substances for *Lupinus albus* being given:

SUBSTANCE.	TOXIC VALUE.
Mon-Acid Phenols—	
Benzophenol, $C_6H_5(OH)$	$\frac{1}{400}$
Benzophenol + 1 NaOH	$\frac{1}{400}$
Di-Acid Phenols—	
Pyrocatechin, $C_6H_4(OH)(OH)$ 1 : 2	$\frac{1}{800}$
Resorcin, $C_6H_4(OH)(OH)$ 1 : 3	$\frac{1}{200}$
Resorcin + 1 NaOH	$\frac{1}{400}$
Resorcin + 2 NaOH	$\frac{1}{800}$
Hydroquinone, $C_6H_4(OH)(OH)$ 1 : 4	$\frac{1}{1600}$
Tri-Acid Phenols—	
Pyrogallol, fresh solution, $C_6H_3(OH)(OH)(OH)$ 1 : 2 : 3	$\frac{1}{1800}$
Pyrogallol, old solution	$\frac{1}{6400}$
Phloroglucin, $C_6H_3(OH)(OH)(OH)$ 1 : 3 : 5	$\frac{1}{400}$
Homologues and Derivatives—	
Ortho-cresol, $C_6H_4(CH_3)(OH)$ 1 : 2	$\frac{1}{800}$
Ortho-cresol + NaOH	$\frac{1}{400}$
Meta-cresol, $C_6H_4(CH_3)(OH)$ 1 : 3	$\frac{1}{800}$
Meta-cresol + NaOH	$\frac{1}{400}$
Para-cresol, $C_6H_4(CH_3)(OH)$ 1 : 4	$\frac{1}{1800}$
Para-cresol + NaOH	$\frac{1}{1600}$
Carvacrol, $C_6H_3(CH_3)(OH)(C_3H_7)$ 1 : 2 : 4	$\frac{1}{3200}$
Carvacrol + NaOH	$\frac{1}{3200}$
Thymol, $C_6H_3(CH_3)(OH)(C_3H_7)$ 1 : 3 : 4	$\frac{1}{3200}$
Thymol + NaOH	$\frac{1}{3200}$
Orcin, $C_6H_3(CH_3)(OH)(OH)$ 1 : 3 : 5	$\frac{1}{400}$
Ortho-nitrophenol, $C_6H_4(OH)(NO_2)$ 1 : 2	$\frac{1}{12800}$
Ortho-nitrophenol + NaOH	$\frac{1}{3200}$
Para-nitrophenol, $C_6H_4(OH)(NO_2)$ 1 : 4	$\frac{1}{6400}$
Para-nitrophenol + NaOH	$\frac{1}{6400}$
Nitro benzene, $C_6H_5(NO_2)$	$\frac{1}{3200}$
Tri-nitro phenol, $C_6H_2(OH)(NO_2)(NO_2)(NO_2)$ 1 : 2 : 4 : 6	$\frac{1}{3200}$
Sodium picrate	$\frac{1}{800}$
Anisol, $C_6H_5(OCH_3)$	$\frac{1}{400}$
Guaiacol, $C_6H_4(OCH_3)(OH)$ 1 : 2	$\frac{1}{800}$
Salicylic acid, $C_6H_4(OH)(COOH)$ 1 : 2	$\frac{1}{6400}$
Sodium salicylate	$\frac{1}{100}$—$\frac{1}{200}$
Methyl salicylate	$\frac{1}{1800}$

Phenol	$\frac{1}{400}$
Phenol + 1 NaCl	$\frac{1}{400}$
Phenol + 2 NaCl	$\frac{1}{400}$
Phenol + 3 NaCl	$\frac{1}{400}$—$\frac{1}{800}$

A number of conclusions to which these results point deserve a brief consideration.

The toxic action of the simplest phenol, carbolic acid, while not great in comparison with the acids and the heavy metals, is seen, nevertheless, to be very considerable. To what is it due? A number of possible alternatives are open to us. If its molecules dissociate, hydrogen ions will occur in the solution; also anions consisting of the remaining major part of the molecules so breaking up. If not completely dissociated it is plain that a greater or less number of unaltered molecules will remain in the solution. It is known that hydrogen ions, which give to acids the characteristic property of combining with bases, are engaged on the addition to the solution of an alkali, giving a sodium salt. If to the phenol, therefore, a chemically equivalent quantity of NaOH be added, any H ions that may be formed will be engaged by the OH groups of the sodium hydroxide, removing both the acid and the alkaline ions from the solution in proportion to the number of such combinations made. Thus, in the typical reaction, the sodium salt and water would result. It has been found that the Na ions in the weak solutions here used are of no appreciable toxic value. If the anion radicle from the acid is also weak or harmless, a solution physiologically much weaker must result from the addition of NaOH. If the anion radicle is in itself poisonous in its properties, the resulting solution will be still more or less markedly toxic. By the study of the original substance, and then of this substance plus a chemically equivalent quantity of NaOH, we are able to arrive at an approximate idea of the amount of dissociation of the phenol. In case few H ions are present, the NaOH remains in the solution as an added constituent of some toxic value. It has been proved difficult to determine the toxic value of NaOH on account of the CO_2 in the solution, absorbed from the respiring living plants and from the air, but it lies not very far from 200.*

Turning to the table, the toxic value of Na phenolate is the same as that of phenol. This indicates, therefore, a slight degree of dissociation, and the conclusion we must accept is that the poisonous action of carbolic acid on these plants is due to the undissociated molecules of the phenol. Bader finds by physico-chemical methods that dissociation is almost nil.

The di-acid phenols show very diverse results. The three isomers, pyrocatechin, resorcin and hydroquinone, illustrate this statement. The toxic value of the ortho-compound is $\frac{1}{800}$; of the meta-compound, $\frac{1}{200}$; of the para-compound, $\frac{1}{1600}$. It is known that pyrocatechin and hydro-

* Kahlenberg and True, Bot. Gaz., 22, p. 95.

quinone, in the presence of light and of air, break down into other substances. From our results it appears that these are much more toxic than the original phenols. The nature of these substances is now under study, and the toxic action must therefore be passed over with the mere numerical statement. This is seen to be very considerable, especially in the case of hydroquinone acting on *Spirogyra*. The solution here found to be so vicious had been exposed to the light for a much longer time than had those used in the other cases. The meta-compound, resorcin, does not seem to act in this manner, and we have no reason to believe that we have here other than the action of the unchanged substance. It is seen to be a little weaker than phenol. The addition of NaOH shows no decrease of toxic action due to the removal of H ions, but rather an increase in proportion to the quantity of the alkali added. Dissociation, then, is either very slight or does not occur at all in this substance.

When three H atoms of the benzene ring are replaced by OH groups in the tri-acid phenols, results are again variable. Pyrogallol breaks up into more toxic substances, as it stands in contact with the air, and takes on toxic properties, in the old solutions, equalling those of a strong monobasic mineral acid. Chemical investigation has shown that in reality an acid does result, and to its H ions probably much of the poisonous action is due.*

The other tri-acid phenol studied, phloroglucin, is stable, and has a toxic value equal to phenol. Dissociation, here, is probably very slight, and the toxic action is due to the molecule as a whole.

By comparing the toxic values of phenol with one H replaced by OH; resorcin with two H atoms replaced by OH groups, and phloroglucin with three OH groups—all of them stable compounds—we conclude that the number of H atoms replaced by OH groups exercises in itself little effect on the toxic value of the molecule.

In view of the fact that, instead of OH groups, a number of other radicles can be introduced into the molecule, it seemed desirable to try to ascertain the effect wrought by some of these changes.

In the cresols we have one H replaced by a (CH_3) methyl group and one by an OH group. These three isomers were tested, likewise their sodium compounds. The cresols themselves are all more poisonous than the compounds containing no (CH_3) group, the para-compound being the most active of the isomers. The sodium compounds of the ortho- and meta-cresols are less poisonous than the original phenols, hence an appreciable—indeed, a very considerable—degree of dissociation takes place in these dilutions. The para-sodium compound is seen to have the same toxic value as the phenol itself; hence we should be led to infer that dissociation plays little part in the physiological action of para-cresol.

* Clairmontaine and Chantaed, Berichte, XV, 1457.

In Bader's* physico-chemical study of these substances, the ortho-compound was found to be more dissociated than the meta-, which in turn gave a higher constant than the para-cresol, the order likewise indicated by the results with the plants.

Two substances, carvacrol and its isomer thymol, in which three hydrogen groups are replaced by a methyl group (CH_3), an hydroxyl group (OH), and an isopropyl group (C_3H_7), respectively were tested. Both these substances were found to have a toxic value of $\frac{1}{3200}$. Since after the addition of NaOH the same toxic equivalent was found in each case, these compounds were assumed to be practically undissociated. No study seems to have been made from the physico-chemical standpoint. The new radicle present, the isopropyl group (C_3H_7), seems to have brought an increased toxic action.

Orcin seems not to have been investigated with reference to its degree of dissociation, and, since we made no study of its sodium compound, there remains nothing to do but to offer the bare result, a toxic value of $\frac{1}{400}$.

With the introduction of the (NO_2) nitro group, we find a very decided increase in the toxic action. Ortho- and para-nitrophenol only were at our disposal. The conduct of the plants with reference to the ortho-compound and its sodium compound is interesting. The phenol itself is seen to be very toxic, $\frac{1}{12800}$, exceeding in this respect even the mineral acids, and approaching the less harmful heavy metals. The addition of a chemically equivalent quantity of NaOH reduces the toxic value to $\frac{1}{3200}$, indicating a considerable degree of dissociation and either a strongly toxic anion or a powerful undissociated residue. Bader's* results from a study of the electrical conductivity show 2.9 per cent. dissociation at a dilution of one molecular weight in grams in 2000 liters; 1.43 per cent. in 500 liters. At the extreme dilution used in our experiments a very much higher degree of dissociation is to be expected.

Para-nitrophenol seems to be somewhat less poisonous, but its sodium compound has an equal toxic value; indicating very little dissociation and a molecule effective in its entirety. Bader † finds an appreciable amount of dissociation, 0.9 per cent. in 500 litres. At this degree of dilution we should expect a much greater proportion, one likely to produce noticeable effects. A further investigation of this point is contemplated.

By introducing a nitro group into benzene we get a compound which lacks OH groups; this gives us a means of testing the action of the NO_2 group in still another form of compound. Its toxic value is seen to be $\frac{1}{3200}$, as in the Na compound of O, nitrophenol. This sodium compound lacks H ions, as does also the nitrobenzene. This relation gives us a clear idea of the toxic effect produced by the (NO_2) group.

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* Bader, *loc. cit.*

† Bader, *loc. cit.*

Tri-nitrophenol, picric acid, has been shown by Ostwald * to behave much like a strong acid, undergoing dissociation to a great degree. Here, then, we have harmful H ions and the poisonous anion containing three (NO_2) groups. As a result, a strong physiological action is produced, its toxic value being $\frac{1}{6400}$, equal to HCl and HNO_3.† The sodium salt shows a marked decrease in poisonous properties, being but about one-eighth as active.

This marked difference may be regarded as a measure of the effectiveness of the H ions. The strong action of this sodium salt is probably in large part due to the toxic anion containing the (NO_2) groups.

A comparison of the conduct of the plants placed in picric acid with that seen in the mono-nitrophenols shows that the introduction of one (NO_2) group increases the toxic action of the compound to a marked degree, but the multiplication of (NO_2) groups within the limits here found does not strengthen the poisonous action of the substance.

Anisol may be regarded as carbolic acid in which the OH group is replaced by an (OCH_3) oxymethyl group. A comparison of the toxic value of phenol and of anisol shows a like limit for both. By replacing one (OH) group of pyrocatechin by (OCH_3) an oxymethyl group, guaiacol, results with a toxic value of $\frac{1}{800}$, the limit found for pyrocatechin.

As far as these instances permit us to draw a conclusion, it seems that the (OCH_3) group has no effect on the toxic action of the phenol in which it replaces an (OH) group.

In salicylic acid, we have a phenol possessing, at the same time, the properties of an acid. Since its phenol characteristics are much less prominent than those due to its acid nature, it is usually thought of as belonging to the latter class. The carboxyl group (COOH) occasions its acid properties. The toxic value ($\frac{1}{6400}$) is that characteristic of a completely dissociated, mono-basic acid. By replacing the acid H with Na, itself a harmless ion, we get a salt having a relatively very small toxic value ($\frac{1}{100}$–$\frac{1}{200}$). The H ion is here plainly the most active agent of destruction. If instead of Na, the acid H is replaced with a methyl group (CH^3) methyl salicylate, oil of wintergreen, results. This is seen to be much more poisonous than Na salicylate. This is probably due to the splitting up in solution of this salt into methyl alcohol and salicylic acid, which latter compound we have found to contain, in this concentration, many H ions.

SUMMARY.

It has been shown by a number of authors, Pfeffer, Engelmann, Nägeli, and others, that plants are very sensitive toward the action of many chemical substances, certain classes of compounds in very minute quantities

* Ostwald, Journ. f. prakt, chemie XXXII., 354.

† Kahlenberg and True, *loc. cit.*

proving strongly poisonous. This sensitiveness of plants to chemical substances has proved a very delicate test for certain compounds when diluted far beyond the capacity of the usual means of chemical identification. When solutions of definite content are used, this sensitiveness of the plants admirably fits them to serve as test objects for the investigation of many chemico-biological questions, especially those connected with the action of poisons. A study of the toxic action of the group of substances known as phenols, or the radicles of *Lupinus albus* L., and on *Spirogyra* sp., has shown that living organisms respond in a definite manner to substances having a definite constitution; the reaction of the protoplasm being therefore governed by chemical laws.

Electrolytic dissociation of the molecules of these compounds into ions plays a subordinate role in their physiological action, the undissociated molecules, therefore, determining to a large degree the physiological properties of the solutions. As instances of substances in which electrolytic dissociation plays a more or less pronounced part, picric acid and salicylic acid may be noted. In the cresols and the mono-nitrophenols, a considerable part of the toxic activity of the solutions seems to be due to the products of such dissociation.

In pyrogallol and methyl salicylate, other processes of molecular breaking down produce substances which dissociate electrically and increase the poisonous activity of these substances. Some phenols are comparatively weak in their integrity, but quickly break down to much more vicious substances. Pyrogallol, pyrocatechin and hydroquinone are examples.

Certain chemical radicles seem to have specific properties when introduced into the molecule, modifying the toxic value of the same. The number of hydroxyl (OH) groups present in the molecule seems in itself to have little influence on the toxic action of the phenol.

The introduction of CH_3 groups into the benzene nucleus increases the toxicity to a considerable but somewhat variable degree. The introduction of the isopropyl group (C_3H_7) into the cresoles increases the toxic value of these substances. The presence of one or more nitro groups brings a decided increase of toxic value. When the hydrogen atom of an OH group is replaced by a CH_3 group, little influence on the toxic properties toward these plants is exerted. The carboxyl group (COOH) brings an added degree of toxicity corresponding to the degree of dissociation.

Madison, Wis., August, 1897.

MINUTES

OF THE

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

FIRST SESSION.—FRIDAY, AUGUST 27, 1897.

The Chairman, Prof. Hallberg, called the meeting to order at 10 o'clock a. m., and, calling Dr. Whelpley to the Chair, proceeded to deliver the following address:

CHAIRMAN'S ADDRESS.

Craft ahoy! whither are you drifting? Thus we may well hail the pharmaceutical craft. It may not be rudderless or unseaworthy; it may not, from its general appearance, even have many of the qualities of a craft, but its armamentarium—its freight—is certainly one of the queerest collections that was ever assembled since Noah's ark stranded on Mount Ararat.

The practice of medicine and of pharmacy have always been noted for the curious and weird character of their remedial agents, but where is the description anent apothecary shops of Goethe, Schiller or Shakespere as compared with the additions to the recent materia medica?

The scorpions and troglodytes, the talus leporis (rabbit foot), the adeps homini and pulmo vulpis, were no doubt wonders of their time, but they are insipid and commonplace compared with the pituitary, pineal, suprarenal, and other glands; substances ovarian, uterine-wall and kidney, not to mention didymin, spleen and cerebrinin, evidently the twentieth century evolutionary product of the cranium *humanum sine igne preparatum* of our old friends, predecessors of Boerhave, of Scheele, of Liebig, Pasteur, Virchow, and the hosts of pharmacists and chemists, who if now appearing on the stage, would recognize the old tradition and superstition which they devoted their lives to explode, stalking through scientific medical circles in the garb of the charlatans and pork-packers in this the dawn of the twentieth century era of progress.

In this materialistic age, the human body is simply a complex machine; if any of its valves or organs become impaired, it is repaired by substituting another sound or perfect part for that injured. If the kidneys are diseased, administer some "kidney substance." What could be a more simple and sure cure! Our mechanic progress has been so great in

acoustic apparatus and bicycles that so simple a thing as the human body to fix and repair is easy! But the progress is not all in one direction. We are after our polypharmacal friends of Nero's time, and can also show them a trick or two. Andromachus and Damokrates may pride themselves on the variety of ingredients in their confections; the burghers of Nuremberg may think that their wise men had the process for the preparation of theriac down fine; but their claims are but a hollow mockery compared with the arcana prepared lege artis in the town of St. Louis and other places of pharmacal lore.

To show the possibilities of combinations of these fin de siecle pride of the pharmacal art, the following may be given as an exceedingly common prescription:

Zinci phosphidum	gr. iii.
Freligh's tonic	ʒ iii.
Heart tonic tablets (Mulford's)	xxxv.
Cactina pellets	xxxv.
Ext. convall. majalis fl	ʒ iii.
Ext. calumbæ fl	℥ i.
Cascara sagrada arom. (Stearns')	℥ i.
Syrup. hypophosph. (McArthur's) ad	℥ vi.

M. et Sig., teaspoonful three times daily.

There are others, even worse than this one, but one example is enough, they are only too familiar.

But the illustration is given in order to direct attention to a practice recently coming in vogue, namely, the prescription of a certain number of tablets for solution in liquid mixtures. Sometimes the prescriber orders, say, 50 strychnine tablets, $\frac{1}{100}$ gr., for solution in an elixir, etc., instead of ordering one-half grain of strychnine itself. The inference must be that the prescriber does not trust the pharmacist with weighing out the required quantity; perhaps he has observed that the prescription balances are not always accurate as they should be. But he should know that every *pharmacist* prepares accurately solutions of strychnine and other alkaloids in larger quantities, and from these there is no difficulty in securing the most accurate result. But what guarantee has he that these tablets are accurately prepared? Who are these tablets made by? Often by non-pharmacists and frequently by fakirs, that never saw the inside of a pharmacy, but run a physician's supply house. And yet, medical men in the front rank of the profession are guilty of such practice, which can only be characterized as an insult to every qualified pharmacist. The vicious attacks on druggists in the medical journals, and especially several sheets published in St. Louis, are doing a great deal of harm and causing the breach to widen between the physician and the pharmacist, with the corresponding twin-evils of physician-dispensing and pharmacist-prescribing. Something should be done to bring about a better understanding between these two so intimately related classes. The custom of some State Pharmaceutical Associations, such as the Missouri and Pennsylvania, to make an exhibit of the National Formulary preparations at state medical societies' meetings, with proper descriptive literature, is in the right direction. But there will be no marked improvement in medical prescribing, or permanent relief from the proprietary medicine evil, until a change is brought about in medical literature, and especially in the standard works of reference. The text-books on materia medica, therapeutics and pharmacy, mostly employed in the medical colleges at the present time, are devoted to exploiting proprietary medicines; one largely used text-book is simply an adaptation of an English work, in which more attention is given to the British Pharmacopœia than the United States Pharmacopœia, while the National Formulary is entirely ignored.

Proprietary articles are often extensively referred to in works and papers of specialists by some ephemeral name, without giving the reader the slightest clue to their character

In a recent work on "Diseases of the Nose and Throat," "lavolin" is recommended throughout the book to be used as a spray, without the slightest intimation that there is a liquid petrolatum in the United States Pharmacopœia.

In sharp contrast to this prevalent attitude is the pharmaceutical portion of a work recently issued, "Butler's Materia Medica and Therapeutics," in which the pharmacy of the United States Pharmacopœia, as well as the National Formulary, are very thoroughly treated. A medical student learning from such a work as a text-book will furnish a physician who will not only be familiar with all the official, and most of the unofficial preparations, but will know how to formulate his own prescriptions and eschew proprietary nostrums.

This should be a part of the campaign against the nostrum evil; another might be for pharmacists to offer to exchange proprietaries that are sent gratis to medical colleges, hospitals, etc., with such preparations of his own that the institution might want to use, with advantage to himself and eventually to pharmacy, in withdrawing from the use of beginners these incentives to self-medication.

EDUCATION.

"The board meets next month. I am very anxious to pass as R. P. Let me know what to do."

"Yes. Assuming that you are a registered assistant and have from three to four years experience in a drug store, our advice is to first qualify yourself before you try the examination. If you are so situated, by all means attend a school or college of pharmacy. If this be impossible, then subscribe for a course of home study by mail. Take at least a six months' course, study at least one hour each day for five days per week, get your preceptor, or older clerk, to assist you and to quiz you preparatory to writing out your answers to the questions. At the end of six months, if you are satisfied with your work and rating received, you may try the examination, but not before." This is the only kind of advice the candidate should have.

But, look at the spectacle! Men and boys, often without any preparation whatsoever, keep coming up before the Board time and again, sometimes nearly half a hundred times in the course of years. These persons cannot realize their unfitness until they begin to study. There are many instances on record where they have quit the business after struggling with the *pons asinorum* of pharmacy—specific gravity. So that it will be observed education is also of value in its negative results. The average young person has the most hazy idea of the object of study, or rather of examination. It may be added that this is shared in by some Boards, or members of Boards, who seem to think it all but criminal to advise a young candidate to qualify himself, and as to the proper course to pursue. The following reply to the circular of this Committee last year, requesting a set of the examination questions, also presents a peculiar phase of this subject.

"All persons taking the examination before this Board are sworn to secrecy, that is, not to divulge any of the contents of the schedule given them, and we hardly think it would be consistent in us after swearing applicants for registration to secrecy, to publish a list of our questions. It does not matter to us where a person gets his information, whether from quiz-compends or not, if they are able to answer correctly seventy-five per cent. of the questions propounded to them, we consider that they are competent to practice pharmacy, providing of course that they have had the required practical experience. Fifty-three persons took the examination before this Board at the last examination, and only eleven were passed. This showing, we think, ought to dispel the idea from the mind of any person that quiz-compend students, or any others for that matter, have to be pretty well qualified before a diploma is granted them by this Board."

I desire to again direct attention to the inadequacy of the public school instruction in some localities. At the meeting of the National Educational Society this year, many valuable papers were presented, all going to show that the curricula need revision.

Poorly equipped as many young persons are when entering pharmacy, it is no wonder that they expect to qualify for a Board examination in a couple of months, or that they may get a diploma from a college of pharmacy in ten weeks.

It is to be regretted that this question proposed last year for presentation to the State Pharmaceutical Associations should have met with such little response, and it is recommended that it be again presented to these associations for report to this Section next year.

COLLEGES.

There were 4,098 students of pharmacy in the 43 colleges in the United States last year, the number in each school ranging from 5 to 606. Eleven schools had less than 25 students, seven had between 25 and 50, nine had between 50 and 75, six had between 75 and 100, five had between 100 and 200, two between 200 and 300, and only one exceeded 400. Some of the best known and highest standard schools grant the degree Ph. G., 15 grant Ph. C., 7 grant Phar. D., 7 grant B. S., 4 grant Phar. M., and one Phar. B. (Bachelor of Pharmacy). Eighteen schools grant two degrees, one grants three and one four degrees.

This multiplicity of degrees and requirements seems to be on the increase. During this year we note the following changes:

Cleveland school has established a three-year course of 8¼ hours per week with Ph. C. degree.

California College has changed its terms from summer to winter.

Chicago, Ills. University, adopted a three-year course for Ph. C., the third year requiring forty hours per week for 28 weeks of work in bacteriology and advanced chemistry, in addition to the two-year course for Ph. G., but without requiring experience in pharmacy.

Brooklyn College has adopted the "Phr. D." degree.

Massachusetts College has adopted a new degree, Ph. C., including bacteriology, milk, butter and water analysis.

St. Louis College has adopted the Ph. B. degree for graduates without experience in pharmacy.

Great Britain Pharm. Society's School has extended the first-year term to nine months; second-year, six months.

How can co-educational schools, like pharmaceutical colleges, award the degree of bachelor? Would it not be possible for a bachelor in pharmacy to marry another fair bachelor in pharmacy? In that event both must lose the degree.

The subject of degrees was discussed at the meeting of the National Educational Association, at its Milwaukee meeting, by Henry Wade Rogers, the President of the Northwestern University, in a paper entitled "State Supervision of Degree-Conferring Universities," in which he said, among other things:

The cause of professional and of academic education suffers for the want of adequate state supervision. Professional schools have been established, generally in the large cities, which are governed by purely commercial standards. We have in this country schools of law, medicine, dentistry and pharmacy that appear to be organized and conducted for the purpose of making money. They are stock corporations, the stock being generally held by members of the teaching force, the teachers being chosen not for their fitness for any particular chair, but because of their willingness and ability to put up the money that is needed. The shorter the course of study the cheaper the class of teachers; the less expended for books and apparatus, and the easier it is made to be admitted and graduated, the greater the number of students becomes, and the larger the amount of dividends paid.

Men who make merchandise of professional education have low professional and scholastic ideals. They are inclined to receive all students who apply for admission, without much regard to their previous preparation or their moral character. They allow

the students thus admitted to continue in their school without being concerned greatly as to the manner in which they apply themselves to study. They graduate them after an attendance for the allotted period, without scrutinizing too closely the extent of their ignorance, and confer upon them a degree which in theory is supposed to stand for high attainments.

This sort of thing, impossible in Europe, should be made impossible in America. Such a condition of affairs is demoralizing beyond question. The tendency of it is all in the direction of low standards. It destroys the value of degrees. It imposes on the public a class of educational charlatans, and works injury to the students whom it falsely pretends to educate. It multiplies the difficulties in the way of those institutions that are endeavoring to do their work according to the highest standards. A faculty of law, or medicine, or dentistry, or pharmacy—that is, conducting a school on any such basis as that described—ought not to have authority to confer degrees. There should be no hesitancy in declaring that the interests of education, and therefore the interest of the public, require that when the state does not exercise a power of supervision and does not establish a minimum standard of admission and graduation, it should withhold from every stock company the power of conferring degrees. I do not desire to be understood as intimating an opinion that no school can be worthy of public confidence which is conducted by a stock corporation paying dividends to its members, but only that the danger from schools of this class is so great that it is not wise, in the absence of state supervision, to entrust them with the degree-conferring power. While here and there a dividend-paying school may exist with high standards, and be worthy of confidence, the influence of the great majority of schools conducted for the purpose of revenue is so bad from an educational point of view, that the state would be justified in withholding from them all degree-conferring power.

The laissez faire policy, which is responsible for the existing abuses that characterize our educational affairs, is not in favor in the State of New York. That State has set an example which deserves to be followed by other American States. Its legislation on this subject has been wisely framed. The Legislature of that State, at the first session after the close of the Revolutionary War, created the University of New York and placed the same in the control of a Board of Regents composed of men of the highest character and distinction. The University of New York is not a teaching body. It includes and has supervision over all the colleges and academies of the State, although each has its own board of trustees for the management of its individual affairs.

The Regents of the University of New York are elected by the Legislature of the State, and no person can at the same time be a Regent of the University and a trustee or officer of any one of the colleges or academies of the State. The laws of New York confer upon the Regents authority to incorporate universities, colleges, academies and other institutions, with such powers and subject to such limitations and restrictions "as the regents may prescribe in conformity to law." They are also given the right, for sufficient cause, to suspend or revoke the charter of any educational institution.

The State of Pennsylvania has recently followed her sister State. In 1895 the Legislature of that Commonwealth passed an act creating a College and University Council, and conferred upon it full authority to decide upon the advisability of chartering new institutions.

May we not hope that in the several States legislation may be obtained which shall protect the universities of the country from the evils which exist from the failure to exercise a supervision deemed essential by European States? We Americans need to rid ourselves of the notion that a "go as you please" policy is good enough for us. The time has come when institutions doing only preparatory work should not be permitted to confer university degrees, and that professional schools established as money-making institutions should be deprived of the power of conferring degrees." * * * *

The Danish Sanitary College has ordered pharmacists to make their own preparations that these may be properly prepared, since testing is often accomplished in a perfunctory manner, and that besides, ready-made preparations degrade the pharmacist to a mere retailer and prevent him from fulfilling his obligations to his apprentices.

Evidently, pharmaceutically speaking, there is nothing "rotten in Denmark." The so-called pharmaceutical schools or colleges in England, with exception of the schools of the Pharmaceutical Society in London, are mostly but cramming and catch-penny affairs. Thus we find among the announcements the following exclamations:

"The course for the July examinations has commenced. (May 23.)"

"The following passed at the April examination. Send for pass lists."

"The principal is confident that if a student works there will be little fear of his failing to pass his examinations."

"Mr. —— personally conducts all the more important work, and all departments are under his constant supervision."

It is hoped that it will be a long time before any school or college in this country indulges in this style of exploitation.

BOARDS AND EXAMINATIONS.

The Pharmaceutical Society of Great Britain has decided to raise the examination fee from 25 dollars to 50 dollars; the fee for dentists and veterinarians is 100 dollars. This is in sharp contrast to the fees charged by our Boards. There is no doubt that the fee should be raised to at least 10 dollars for pharmacist and five dollars for assistant. This would have a tendency to decrease the number who apply for examinations, which is often abnormally large, several hundred candidates often being examined at the time in the populous states. Such large numbers cannot be properly nor thoroughly examined. The examinations could be profitably conducted in the colleges, where there are all the necessary facilities, and members of faculties should be appointed as auxiliary examiners.

California Board requires for examination grammar school certificate.

Kentucky Association rescinded in 1896 the action of the Association in 1895, that no director or member of the faculty of the Louisville College of Pharmacy should be eligible to membership of the Pharmacy Board.

North Carolina Board rescinded its reciprocity arrangement with other Boards.

New York Association approved consolidation of all local Boards with the state Boards with a membership of nine.

West Virginia. The Board of Public Works has appointed a new Pharmacy Board. The office of the members of the old Board not having expired, they refuse to resign.

In conclusion, I desire to make the following recommendations:

1. That the preliminary educational requirement for apprentices be continued to the state associations for report next year.

2. That the rules of the Association for advancement of science, for orthography and pronunciation of chemical terms, be reported upon at next year's meeting.

3. That the feasibility of the creation of some sort of memorial of Hermann Hager be reported upon at next year's meeting.

4. That a set of rules for division and conduct of the work of the Section be presented next year for adoption and incorporation in the By-Laws.

On motion of Mr. Sayre, seconded by Mr. Feil, the address was ordered to be referred to a committee of three for report upon the recommendations contained therein.

The Secretary's report was called for, and Mr. Beal presented the following:

REPORT OF THE SECRETARY.

LEGISLATION.

The year just past has been one of unusual activity in legislation affecting pharmaceutical affairs. A resumé of projected and enacted laws is as follows, the texts of the several laws being given in full at the close of this report:

Alabama: Law revised and extended to towns of 500 inhabitants.

Delaware: Law amended so as to require registration every three years.

District of Columbia: Bills introduced in Congress to amend the pharmacy act, and regulating the sale and labeling of poisons.

Georgia: $1000.00 appropriated for use of the Board of Pharmacy to procure analyses of goods suspected of being adulterated.

Illinois: Bill affecting sale of proprietary medicines—defeated. Bill regulating sale of cocaine—passed. Medical Practice Bill—defeated. Department Store Bill—defeated.

Indiana: Pharmacy law enacted by the legislature, but vetoed by the Governor.

Kansas: Legislation reported. Character unknown.

Kentucky: Bill to amend pharmacy law. Defeated.

Maine: Law amended and extended.

Massachusetts: Bill to require renewal of registration, and to otherwise amend the pharmacy act. Defeated.

Michigan: Bill introduced to permit physicians to practice as pharmacists. Defeated.

Nebraska: Bill to repeal the present pharmacy act. Defeated.

New Hampshire: New poison law adopted.

New York: Extension of the law increasing the list of articles which may lawfully be sold by dealers in general merchandise. Pharmacy laws and Boards of New York and Kings Counties consolidated, to take effect January 1, 1898. Bill to consolidate all the laws and boards in the State. Defeated.

North Carolina: Law amended by striking out the words, "registered pharmacist," and substituting the words "licensed pharmacist."

Oklahoma: Legislation reported. Character unknown.

Pennsylvania: Law enacted relating to the sale of adulterated drugs. Bill passed by the General Assembly to restrict ownership of drug stores to registered pharmacists. Vetoed by the Governor.

Rhode Island: Bill to amend the pharmacy law. Defeated.

South Carolina: Bill to permit physicians to register as pharmacists without examination. Defeated.

South Dakota: Law amended giving Justices' Courts jurisdiction in cases of violation of the pharmacy law.

Tennessee: Law revised and amended.

Washington: Bill to amend the pharmacy act. Defeated.

Wisconsin: Bill permitting physicians to register as pharmacists — defeated. Law enacted relating to adulteration of food and drugs. Law enacted permitting sale of proprietary medicines by dealers in general merchandise. Law enacted regulating the practice of medicine. Bill introduced to repeal the present pharmacy act — defeated. Bill to require the labeling of proprietary medicines with names of their constituents — defeated. Bill to require the dispensing of poisons in triangular bottles of red glass —defeated.

In addition to the foregoing, legislation, or attempted legislation, has been reported from other states, but it has been impossible to obtain information regarding the same from Secretaries of Boards of Pharmacy.

From the above it will be noted that in two states efforts were made to repeal the pharmacy laws, and also that in three other states bills were introduced to permit physicians to practice as pharmacists without examination.

Several of the laws enacted might properly be criticised, though as a whole the legislation for the year is a decided advance for the improvement of the practice of pharmacy, and for the protection of the public health. However, several excellent and proper bills were defeated, and it is with especial regret that we note that the pharmacy act passed by the Indiana legislature was prevented from becoming a law by the veto of the Governor of that Commonwealth.

REGISTRATION STATISTICS.

In collecting statistics for this year it has been attempted to ascertain the following facts:

The total number of registered pharmacists and assistant pharmacists in the United States, the number of each grade registered last year, and of these the number registered without examination either on diploma of pharmacy or medicine, or on experience. It has also been endeavored to ascertain the total number of graduates in pharmacy, and of women enrolled on the registers of the Boards of Pharmacy within the United States Notwithstanding the utmost efforts of your Secretary, these statistics are only approximately perfect. · From some Boards no reply has ever been obtained, even after addressing five or six requests for information. It seems strange that some Boards cannot be sufficiently interested in the work of this Association to give the few minutes necessary to the examination of their records, when the Secretary of this Section must give several weeks' attention to the compilation of this report.

It is evident from the returns received that the records of some of the Boards of Pharmacy are very imperfectly kept, so that the Secretary has himself a very indefinite idea of the number of registered pharmacists in the State, nor is this state of affairs confined solely to the States where re-registration is not required.

As a rule, the Boards which are compelled to make a yearly report to their State Associations keep their records in the best condition and are able to make an intelligible reply to questions addressed to them.

In the following summary, the figures compiled from reports furnished by the Boards are kept separate from the figures estimated by the Secretary of this Section.

All figures are supposed to refer to the last official year of the several Boards.

Number of Registered Pharmacists in United States.

From Board Reports	56,560
Estimated Additional (Idaho, N.Y. City, Texas, Utah, Wyoming).	5,040
Total	61,600

An increase over the report for last year of 5,621.

Number of Registered Assistant Pharmacists in United States.

From Board Reports	8,287
Estimated Additional	2,200
Total	10,487

Increase over number estimated for last year of 518.

NUMBER OF PHARMACISTS REGISTERED LAST YEAR IN UNITED STATES.

From Board Reports	2,334
Estimated Additional	200
Total	2,534

Decrease from number registered preceding year of 1,304.

Of the Pharmacists registered last year there were registered—

On Pharmacy Diploma 331

A decrease from preceding year of 225.

On Medical Diploma 56

A decrease from preceding year of 324.

On Experience, without Examination 219

A decrease from preceding year of 336.

Of Assistant Pharmacists registered last year, there were registered:

On Experience, without Examination 101

A decrease for preceding year of 7.

NUMBER OF GRADUATES IN PHARMACY REGISTERED AS PHARMACISTS IN THE UNITED STATES.

From Board Reports	7,950
Estimated Additional	2,050
Total	10,000

Several secretaries report that so far as they are aware, their respective States do not contain a single graduate in pharmacy.

NUMBER OF WOMEN REGISTERED AS PHARMACISTS AND ASSISTANT PHARMACISTS IN THE UNITED STATES.

From Board Reports	754
Estimated Additional	246
Total	1,000

From the foregoing figures, the following gratifying fact may be noticed, that whereas the report of last year showed an increase in the number of pharmacists and assistants registered over the number registered during the year before, the figures this year show a decided decrease in both classes, as well as a decrease in the number of registrations on diplomas and on experience. This fact, coupled with the circumstance that the reports of board examinations during the past year show almost universally an increase in the per cent. of rejections, indicates that there has been a real advancement in the standard of admission to the practice of pharmacy. Of this improvement, a small portion at least may justly be credited to the work of this Association in compiling and publishing the reports, which have enabled pharmacists to get a view of the general condition over the whole country, and which have apparently been the means of stimulating certain boards of pharmacy, notoriously lax in their requirements, to make a better showing for themselves and for their respective States.

J. H. BEAL, *Secretary.*

The registration by States is shown in the following table:

State.	Total on Rolls.		Registered last year.		Registered without examination.					
	R. P.'s..	A. P.'s..	R. P.'s..	A. P.'s..	Ph. G...	M. D....	Exp....	A. P.'s.	Ph. G.'s on Rolls.	Women on Rolls.
Alabama	778	....	34	....	3	8	42	....	25	8
Aakansas	921	....	30	....	9	....	....	....	75	3
California	1567	807	95	44	....	....	....	....	296	31
Colorado	580	45	37	18	45	....	7	2	150	5
Connecticut	764	....	56	....	13	....	....	....	75	6
Delaware	250	190	14	8	....	....	....	3	....	1
District of Columbia	699	....	72	....	51	....	....	....	297	3
Florida.										
Georgia	1003	....	58	....	....	11	....	....	95	1
Idaho	100?									
Illinois	4500	1300	209	301	....	....	54	63	....	112
Iowa	2700	....	220	10	8	....	....	....	500	75
Kansas	1381	63	78	18	19	....	....	....	150	20
Kentucky	891	50	....	....	6	3	....	....	175	8
Louisiana	957	249	27	7	....	....	....	....	....	8
Maine	759	23	15	2	....	....	17	....	100	11
Maryland (Baltimore)	430	....	13	....	10					
Massachusetts	3743	....	110	....	....	....	....	....	....	56
Michigan	3084	306	67	43	....	...	....	....	154	50
Minnesota	1254	254	54	61	3	4	....	....	....	28
Mississippi	942	....	16	....	....	1	....	....	47	6
Missouri	3000	....	184	....	....	....	....	....	950	9
Montana	240	20	20	7	....	....	....	....	16	1
Nebraska	1493	....	26	....	....	....	....	....	200	57
New Hampshire	585	58	14	10	....	....	....	....	....	2
New Jersey	2476	35	63	12						
New Mexico	77	6	16	6	6	6	....	6	25	1
New York State	4936	197	262	21	....	....	85	....	....	50
New York City.										
New York, Buffalo	196	68	31	20	14	....	7	....	60	4
New York, Brooklyn	918	27	238	17	72	6	....	6	600	12
North Carolina	382	176	43	35	9	8	....	....	50	2
North Dakota	239	77	17	20	....	....	3	20	40	1
Ohio	3165	662	288	150	....	....	....	....	956	45
Oklahoma	211	....	42	....	....	....	....	....	....	1
Oregon	652	75	20	18	....	....	....	....	....	13
Pennsylvania	6327	2893	242	230	....	....	....	....	2000	20
Rhode Island	218	155	4	23	2	....	....	....	13	2
South Carolina	115	....	6	....	2	....	4			
South Dakota	481	15	28	7	....	....	....	....	25	6
Tennessee	764	92	29	15	....	....	....	....	76	8
Texas	1398?									
Utah.										
Vermont	399	2	7	1	....	....	....	1	....	7
Virginia	816	53	12	9	....	9				
Washington	473	61	31	15	8	....	....	....	50	30
West Virginia	635	....	38	....	15	....	....	....	150	6
Wisconsin	1260	325	67	74	6	....	....	....	600	35
Wyoming.										

On motion of Mr. Whitney, duly seconded, the report was accepted and referred to the Committee on Publication.

MR. PRESCOTT: Mr. Chairman, I would like to offer the Secretary an item of information. A bill was introduced into the Michigan Legislature this past year, one provision

of which was to enable graduates in medicine to register for pharmacy without examination. The bill was met by the friends of pharmacy in Michigan with some effect in the Legislature, and the bill did not go very far before it was defeated. This information should have been sent to the Secretary. I am sorry it was not. I cannot give it any more definite form than this. I think the Secretary of the Board of Pharmacy should be able to secure a copy of that bill. But I desire to say, myself, as a member of the Association, and as one engaged in pharmacy education, that we can do no other than appreciate very heartily and very deeply the laborious and faithful work with which this collation has been made in this and previous years. It is worth a great deal to us to have these facts, and a great deal of work is required. I know that every member of this Section feels it in his heart that we owe a debt of thanks to Prof. Beal, the Secretary of the Section. I hope that this work may be continued in this Section; that it be not allowed to drop, although it is in so incomplete a condition now. Of course, every year requires additional work, and we should have of course more complete records. It is a matter of vital issue to the pharmacists of the country.

MR. BARTELLS: I would like to ask the Secretary if the totals of registered pharmacists and assistants are included in the report.

THE SECRETARY: Yes, sir, as near as they can be given.

The Chairman presented as next order of business the Summary of Answers received in response to the Circular of Interrogatories sent out by by the officers of the Section.

SUMMARY OF ANSWERS TO MAIN QUESTIONS OF THE COMMITTEE'S CIRCULAR OF INTERROGATORIES.

COMPILED BY C. S. N. HALLBERG, CHM.

In response to the Circular of Interrogatories 29 replies were received at the date of compilation. Of these one (Ark.) simply suggested that the project would prove futile; another was not signed and could not be identified. From Missouri four replies were received, two of which were condensed so as to give representation to the three interests, the State Association, the Board and the St. Louis College of Pharmacy. The Illinois Committee, representing the State Association, the Board and the two University Schools of Pharmacy, presented its finding in one set of answers, which is, therefore, given a voting power of four (4) in the summary.

☞The figures indicate the affirmative votes, except when stated to the contrary.

Title of Act:	That the real object of the Law, "the protection of the Public Health," be incorporated	4
Territorial:	Uniform for entire state	21, yes; no, 4
	Limited to towns of certain population	1
	Modified for villages less than 500 population	4
	Separate law for cities of over ½ million population	1

Pharmacy Board:

Appointment by Governor 4
Upon nomination by Reg. Ph. 1
Upon nomination by State Asso. 13
Upon nomination by . . . . . Ills., N. J. plan . . 5

Membership: . . . . 5 members.
Experience in Pharmacy, 10 years 14
Experience in Pharmacy, 5 years 5
Graduates: from majority to all . . . . . 14; no, 5
Registered by examination 1

Compensation: Annual salary . . . . 100 dollars, 1
Per diem . . . . 5 dollars, 1; 10 dollars, 3
No compensation 1
Expenses in addition 16

Disposition of Funds: Retained by Board for expenses and enforcement of Law 10
Retained by Asso. and Board jointly . . . 5
State 2
School district 3

Title: State Board 11
Examiners 8
Commissioners 5

Examiners: Appoint Auxiliary Local Boards 2
Appoint Auxiliary Examiners 7

Secretary: Non-member 8
Member of Board 14

Salary: Prescribed . . . . 12; no, 6

Report to: State Pharm. Asso. 20
Governor 23
General Assembly 3
Secretary of State 1

Committee of State Pharm. Asso. . . . . 9; no, 11
State Pharm. Asso.'s Recommendations . . 8; no, 11

Prosecution: The Board 9
State's Attorney 2
Both jointly 14

LICENTIATES AND REGISTRATION.

Two (2) *grades*, 19; *one grade*, R. Ph., 4.

Requirements: R. Ph., Age . . . . 21 years, 22; 20 years, 1
R. Ph., Experience . . 3 years, 4; 4 years, 17; 5 years, 2
R. Assist., Age . . . 18 years, 15; 19 years, 2; 21 years, 1
R. Ass't, Experience . 2 years, 15; 2 years, 2; 3–4 years, 1

Registration of Apprentice . . . . 11; no, 7
Requirements, Age . . 16 years, 8; 15 years, 1
Requirements, School Grammar Certif. . . . 6
High School 1

Registration: on Pharm. Diploma . . . . 4; no, 14
on Medical Diploma . . . . no, 16
by Examination only 20
by Examination and Completion of College Course . . 5
Allowance for College Attendance . . . . 16; no, 4
Proportion . . . . from ¼ to ½ time
Reciprocity . . . . at present, 5; with Uniform Reg., 16
Temporary . . Interval Board Meeting, 16; Provisional, 3

Examinations: Separate for 2 grades . . . . 13; no, 4
General Dealers' License . . . . 17; no, 3

Fees, Registration: Pharm. Diplomas . . . . 2–5 dollars
License of other Board . . . . 2–5 dollars
By Examination R. Ph. . . 5 dollars, 10; 10 dollars, 8
By Examination, R. Ass't . . 3 dollars, 2; 5 dollars, 13

Renewals: Annual . . . . 18; triennial, 1; none, 2
R. Ph. . 1 dollar, 12; 2 dollars, 4; 50 cts. tri., 1
R. Ass't. . . . . 1 dollar, 9; 50 cts., 3
Apprentice . . . . 1 dollar, 5; 50 cts., 2

Registration of License: County Clerk 2

REVOCATIONS.

Violation of Pharmacy Law, 2d offense. 13
Liquor Law 9
Adulteration Law 10
Poison Law 7
Label Law 4

Intemeperanc . . . . 18; narcotic (habit), 14
Failure to Renew Certificate . . . . for 30 days to 10 years, 18
Exhibit Certificate . . . . for 10 days to 60 days, 15
Through Fraud. 24
Retirement from Practice . . . . for 1–5 years, 12
Failure to pay Annual Fees . . . . for 1–5 years, 16

TITLES AND PRIVILEGES.

Definition and Distinction between Pharmacy and Drug Store. . 9; no, 9
Drug Store not to keep . . . . Class A, 1
Drug Store not to keep . . . . Class A, B, C, 4
R. Ph. to have sole right to own and to practice Pharmacy, 18; no, 5
R. Ass't to have the right to practice Pharmacy except, with Class A, B, C 14

Also with A, B, C under supervision 13
With B, C (but not A) under supervision 6
Prepare Prescriptions 13
Privilege temporary absence . . . . . . 12; no, 2; cond., 1
To own, operate a Drug Store . . . . 8; no, 5; own, 1
for town less 500 pop.. 1
Title Registered Druggist 1
To have General Dealer's License . . . . 7; no, 6

R. Apprentice: to assist in preparing, except Class A, B, C . 11; no, 4
dispense (except A, B, C) . 4; no, 3; 2 yrs. exp., 4

EXAMINATIONS.

Registered Assistant Pharmacist:

A theoretical (written) examination, equivalent to a standard Junior College or school of pharmacy examination 16
Practical work in dispensing and compounding 16
Identification of specimen: materia medica, chemicals, pharmacal. 13
Oral examination in simple prescriptions, toxicology, dosage, 14; no, 1
Evidence of attendance and satisfactory completion of a term of not less than 6 months at a College of Pharmacy (prel. to exam.) 4

Registered Pharmacist:

A theoretical (written) examination equivalent to a standard Senior College or school of pharmacy examination 21
Identification of specimen of materia medica 21
Identification of specimen of materia medica, microscopic, 16; no, 2
Identification by reagent of chemicals . . . . 13; no, 5
Identification by reagent of alkaloids, etc. . . . . . 13; no, 4
Identification by reagent of pharmacal preparations . . . . 14; no, 3
Practical work in dispensing and compounding 20
Oral examination in prescriptions . . . . 20; no, 1
Oral examination in toxicology and dosage . . . . 20; no, 1
Evidence of attendance and satisfactory completion of a course of two (2) terms of not less than 6 months each at a College of Pharmacy (preliminary to exam.) 4
Diploma from a College or School of Pharmacy required for admission to examination by the Board. 1

POISON AND LABEL PROVISIONS.

Poison Law: Favored by 23.

Class A dispensed on Prescriptions only . . . . 13; no, 6
Class A: kept isolated . . . . 13; no, 2
Class B: on registration. . . . . 16; opt., 1; no, 2
Label on articles 23
Poison Label, "Red on white" . . . . 17; no, 5

Scarlet wrappers . . . . 9 ; no, 8
Arsenic, colored . . . . 3 ; no, 15
Label on Patent Medicines, when not sold by R. Ph., 19 ; no, 1
only Class A, . . 1 ; only A, B, 1
Registration of Cocaine, Morphine, etc., if sold without Prescription, ... 12 ; no, 1
Prescriptions containing Class A, B, C, refilled without prescriber's order . . . . 3 ; no, 7 ; condit., 5
Retaining original Prescription 21
Shall copy be given. . . 9 ; no, 6 ; opt., 2 ; yes, unless contrary order, 2 ; by permission of prescriber, . . . 1
Refusal of copy except on prescriber's order,
9 ; no, 6 ; condit., 3
Caution of over dose . . . . 12 ; no, 3
"For external use," . . . . 12 ; no, 1
"Not to be taken," . . . . 12 ; no, 1

Adulterations Section in Pharmacy Act . . . . 12 ; no, 5
Separate Statute . . . . 10 ; no, 6

Limited License for General Dealers . . . . 12 ; no, 3

Exemption for Manufacturers and Wholesale Dealers as indicated in Circular practically unanimous except as to No. 93.
Exemption from jury duty . . . . 18 ; no, 3

The following answers were received :
Arkansas Board of Pharmacy, W. W. Kerr, Secy., Russellville.
California Pharm. Assoc., G. E. Bacon, Jno. H. Dawson, San Fransisco.
Colorado Pharm. Assoc., C. M. Ford, Denver.
Georgia Pharm. Assoc., Geo. F. Payne, Atlanta.
Illinois Pharm. Assoc., Albert E. Ebert, Chicago.
Illinois Board of Pharmacy, F. M. Schmidt.
N. W. School of Pharmacy, Oscar Oldberg.
Illinois Univ., School of Pharmacy, C. S. N. Hallberg.
Indiana School of Pharmacy, Purdue, Arthur L. Green, Lafayette.
Maryland (Balto.) Board of Pharmacy, D. M. R. Culbreth, Balto.
Lewis Schulze, Balto.
Henry P. Hynson, Sec'y, Balto.
Maryland College of Pharmacy, J. F. Hancock, Chairman, Balto.
Chas. Schmidt, Balto.
J. Fuller Frames, Balto.
Massachusetts Board of Pharmacy, Jno. Larrabee, Sec'y, Melrose.
Massachusetts College of Pharmacy Trustees, by S. A. D. Sheppard, Boston.
Michigan Univ., School of Pharmacy, A. B. Stevens, Sec'y, Ann Arbor.
Minnesota Univ., College of Pharmacy, Minneapolis.

Missouri Pharm. Assoc., J. M. Good, St. Louis.
Robt. E. Maupin, Pattonsburg.
Missouri Board of Pharmacy, A. Brandenburger, Jefferson City.
F. W. Sennewald, Sec'y, St. Louis.
New Jersey Board of Pharmacy, Geo. W. Parisen, Perth Amboy.
New Jersey Pharm. Assoc., Wm. C. Alpers, Bayonne.
New Mexico Board of Pharmacy, W. C. Porterfield, Sec'y, Silver City.
New York, Kings Co. Board of Pharmacy, E. H. Bartley, Pres., Brooklyn.
New York, Buffalo College of Pharmacy, Willis G. Gregory, Dean, Buffalo.
Ohio Board of Pharmacy, W. R. Ogier, Sec'y, Columbus.
West Virginia Board of Pharmacy.
Wisconsin Board of Pharmacy.
Canada, P. Quebec Pharm. Assoc., R. W. Williams, Three Rivers.
Chicago, August 7, 1897.

The Chair announced as the Committee of Three to whom the address should be referred: Messrs. A. B. Prescott of Michigan, Geo. W. Parisen of New Jersey, and Wm. A. Puckner of Illinois.

THE CHAIRMAN: The next order of business is the nomination of officers of this Section for the ensuing year. A Chairman and a Secretary are to be nominated, the names are to be posted, and they are to be balloted for at the next session.

MR. GOOD: Mr. Chairman, we have on the platform a gentleman who has done excellent work for this Section now for two years, and his excellency in that work is universally recognized, and I would therefore like to see him elected as Chairman of this Section. I refer to J. H. Beal, of Scio, Ohio, and put him in nomination for Chairman of this Section. (Nomination seconded.)

Mr. Hallberg was nominated for Chairman by Mr. Fennel.

For Secretary the following gentlemen were named, all of whom declined: H. M. Whelpley, Oscar Oldberg, Geo. B. Kauffman, F. S. Hereth and C. S. N. Hallberg.

THE CHAIRMAN: I believe the next order of business is the reading of papers.

At the request of the Chair, the Secretary read the following paper in abstract, the author being absent, and on motion it was directed to take the usual course.

SHOULD A PHARMACY LAW BE UNIFORM TERRITORIALLY?

BY EDW. S. DAWSON, JR.

The query "Should a pharmacy law be uniform in its application throughout the State, or should a distinction be made for smaller towns?" etc., is one that this Board has contended with for six or seven years, and has not yet satisfactorily answered. A pharmacy law being fundamentally a health measure, the safeguards placed around the residents of a city or

large village should not be any stronger than those placed around the residents of smaller villages and hamlets, on the theory that the health of a resident of the smaller places is of as much importance, and is entitled to as much consideration, as that of the resident of larger places; but if carried out on that theory, it would work a great hardship and injustice to the druggists doing business in the smaller places. A pharmacy law, to be properly carried out on its theoretical lines, should require a licensed owner of a pharmacy to employ a licensed clerk, and should require unlicensed owners to employ two such clerks, so that a licensed man can be always in charge of the store; but the enforcement of the legal requirements would necessarily force many of the small druggists in villages and hamlets, as well, too, in the cities and larger places, out of business, as their receipts from their daily business transactions would not be large enough to enable them to pay their clerk hire. I will concede that there are too many men conducting drug stores, and that a diminution in the number would work advantageously, but I should dislike exceedingly to be a member of a board of pharmacy that must enforce the requirements of such a vigorous measure; I should dislike to feel that I had legally squeezed some of my struggling pharmacal brothers out of business.

To draw the line, however, on the population of a place might seem reasonable and just, on the theory that the druggists engaged in business, say in places of five thousand (5,000) inhabitants, do less actual practice of pharmacy than those in larger places, and the provisions of the law relating to licensed clerks should not apply to them; yet some of these small places, for three or four months during the year, have a large floating population, and the practice of pharmacy carried on during that time is largely augmented, and the inconsistency of the law becomes very apparent. In this State, the rural districts within the jurisdiction of the State Board of Pharmacy, are allowed considerable latitude, as the unlicensed dealers there can sell not only all of the simple drugs, but also poisons, and poisonous preparations; but the latter must be either in original packages or in packages put up by and bearing the label of a licensed pharmacist. This, from a public health standpoint, is a weak feature of the law, but as a rural district is a place in which there is no licensed pharmacist practicing pharmacy, either as proprietor or clerk, it seems reasonable to allow unlicensed dealers to furnish their patrons with such simple remedies and household poisons as they are accustomed to using, as long as the latter are either in original packages or in packages or bottles put up by and bearing the label of a licensed pharmacist, otherwise their patrons would be obliged to travel inconvenient distances to reach a licensed druggist before they could obtain their much-needed remedies. The abuse of this privilege lies in the fact that these dealers sell the poisons by the measure or from broken packages, but the Board has prosecuted successfully a number of offending dealers for such violations of the law,

and it has reason to believe that the law is now being violated very little, if at all, in that particular. It is, perhaps, needless to tell you, that in order to secure the enactment of a pharmacy law, liberal concessions must always be made to the rural members of a legislature, and I mention it here as a sort of apology for the weak feature of our law just referred to. The Board has recently sent out queries to its licensees, and to the query "Should a store in which pharmacy is practiced be required to be in charge of more than one licensee of the State Board of Pharmacy?" more than eighty per cent. answered with an emphatic *no;* but, of course, each answer was based on the opinion that trade would not warrant the expense of an additional clerk. I am of the opinion that a pharmacy law should be framed so as to secure greater protection to public health, and afford protection to the legitimate druggist up to a point where the cry of "monopoly for the drug business" cannot be set up, but care should be taken that the druggist who receives the least benefit from the operation of the law, should not have his hands legally fettered.

Syracuse, N. Y., August 2, 1897.

The next paper, entitled "Should Pharmacists or the State Support the Pharmacy Law and the Board," was read by the author, Mr. H. M. Whitney.

SHOULD PHARMACISTS OR THE STATE SUPPORT THE PHARMACY LAW AND THE BOARD?

BY H. M. WHITNEY.

The pharmacy laws of this state were the result of long continued and persistent efforts of pharmacists as a matter of justice to reputable pharmacy and protection to the people, the purpose being to prevent incompetent persons keeping and exposing for sale or compounding and dispensing drugs, medicines, chemicals and poisons.

To accomplish this purpose, the law provides for registration "any person . . . paying the fee of $5.00 shall be entitled to examination, and if qualified shall be registered as a pharmacist. Re-examination at a cost of $3.00.

As a matter of fact, many apply for examination with no expectation of passing. Some claim the examinations are of more value than the cost; some apparently as certificate collectors to gratify vanity, and possibly to let, sell or use from Maine to California.

In our experience from October, 1895, to October, 1896, there were 575 examination and 110 were found qualified.

18 passed on 1st examination.
10 passed on 2d examination.
28 passed on 3d examination.
22 passed on 4th examination.
12 passed on 5th examination.

6 passed on 6th examination.
3 passed on 7th examination.
3 passed on 8th examination.
1 passed on 9th examination.
1 passed on 10th examination.
2 passed on 11th examination.
2 passed on 13th examination.
2 passed on 14th examination.

The time covered is from one to five years.

The present year one passed on the eighteenth examiuation. His first examination was in March, 1888, and he passed in June, 1897.

It seems to me, from our experience, that all examinations, whether one or twenty, to secure a personal state certificate of registration, conveying a special and legalized position, with its rights and privileges, should be paid for by the applicant. I certainly can see no justice nor can I appreciate any claim to transfer the costs of these examination from the applicant to the state.

Many laws become practically dead unless enforced, and every state should make an annual appropriation for *this* purpose.

Briefly: Boards of Pharmacy for granting certificates of registration and renewals only should be self supporting.

Enforcing the pharmacy law, poison law, or any other special duty placed by the state upon the board should be supported and paid from the state treasury.

In every department the board should have the moral support and kind assistance of every pharmacist.

Boston, July 20, 1897.

The paper was discussed at some length by Messrs. Ebert, Hallberg, Mason, Thompson, Bartells, Webster, Payne, and the author, after which it was, on motion of Mr. Ebert, seconded by Mr. Sayre, referred for publication.

THE CHAIRMAN: The next paper is entitled "Uniform Pharmacy Law—as to Place of Registration," by Joseph Jacobs.

Mr. Jacobs then read the following paper:

UNIFORM PHARMACY LAW—AS TO PLACE OF REGISTRATION.

BY JOS. JACOBS.

I think there can be no doubt but that it would be desirable that every licentiate should be required to register at the county seat of the county of his residence. This would be a wise provision, because it would make it clear to the licentiates themselves who were their legitimate co-workers, and the public at large could easily ascertain whether they were dealing with a pharmacist duly qualified, or with an imposter.

As to the *place of registration*, that should be uniform as well as the other features of the uniform pharmacy law. If this were true of the laws of all the states, licentiates, the public officers or any other interested person could readily know the proper place to apply to in order to ascertain whether or not any particular person is registered.

Inasmuch as every separate county in every one of the states maintains a court of record in which wills are probated and filed, I would suggest that the *place of registration* be designated in a clause similar to the following:

"All persons qualified by law to practice pharmacy in this state shall, before entering upon such practice, cause their names to be entered upon a book to be kept for that purpose in the office of the clerk of that court in which wills are filed for probate and record, in the county of the residence of such licentiate and of the county in which he does business as a pharmacist." Then follow with appropriate penalty for violation.

As our laws now stand, there are as many variant places for registration as the caprice of legislators might choose in naming some one of the various courts of record in the different states. And, when we reflect that courts of similar jurisdiction in the various states are called by many dissimilar names, we must realize that in order to know where to apply for our desired information of whether registered or not, we shall first be put to the necessity of looking up the local law in order to know where to apply.

It may be said that the courts of probate are themselves known by different names, as for instance "Courts of Ordinary," or "Courts of Probate," or "Registers of Wills," but a letter addressed to the "Court for the Probate of Wills" directed to the county seat of any county, would certainly be delivered to the proper officer.

Let us have uniformity in the place of registration. Without attention to this point there may be almost as great diversity as there are differences in the names of all the courts of record in all the different States of the Union.

It was moved by Mr. Mayo, and duly seconded, that the paper be received.

MR. EBERT: Mr. Chairman, I think the suggestion of Mr. Jacobs is certainly one that ought to be taken into consideration by the committee which is going to draft a uniform pharmacy law.

MR. OLDBERG: Mr. Chairman, I think it would facilitate matters and save time if we would wait and discuss all these questions which are going to be embodied in the draft that is going to be presented to the Section, when the draft is before us. These papers all relate to the details of that pharmacy law. Now, why should we discuss these papers? I therefore move you that the discussion of these papers be deferred until the draft itself is before the Section.

Motion seconded and prevailed.

Mr. Prescott here read in abstract a paper entitled "On Provisions of the Poison Law and Measures for its Enforcement."

ON PROVISIONS OF A POISON LAW, AND MEASURES FOR ITS ENFORCEMENT.

BY ALBERT B. PRESCOTT.

At present there are many dispensing pharmacies without regular registration of the sale of poisons. In some of the States having fairly good registration laws, actual registration depends wholly upon the will of the pharmacist, there being no enforcement of the law, the provisions of which are seldom consulted. Registration of sale of poisons is upon about the same footing that it was before the advent of State boards of pharmacy.

In this situation it seems to the writer the better way, *first*, to propose, as a general State law upon this subject, one that is simple and moderate in its demands, and *second*, to undertake vigorous measures for the enforcement of registration laws.

In the provisions of the law, as to rules of registration of a given poison, I would adopt those of Number 79 of the Legislation Committee Circular. I think I would change the places of the first and second entries. And I would urge a very full and complete registration in every case where registration is made at all.

As to what articles should be registered as poisons, some latitude may be allowed to liberty of individual interpretation at the present time. There must be a beginning.

It is, however, of the first importance to the business interests of pharmacy that local druggists should all act alike in registration, and as to what articles to register. This is a most necessary subject for local and State societies. The druggists of a city, if not organized into a society, may well call a meeting and confer upon what shall be the list of medicines to be always registered as poisons when sold without a prescription. Such an agreement gives a most satisfactory explanation to the purchaser. Why do I have to answer these questions here when I have not been asked the same at other places? Let all the druggists of a town, or of a state, agree upon a certain list of poisons always to be registered, by nearly or quite unanimous agreement. Any druggist can, if he chooses register the sale of still other poisons without violation of such agreement.

As to the *second* named undertaking, that of vigorous measures for enforcement of registration laws, it seems to me certain that this should be the duty of the State Board of Pharmacy. (See 32 of the circular.) The Board is the proper party to look after this. It will give the public and the officers of justice and the medical profession a greater esteem for the function of the Board of Pharmacy and the use of the pharmacy law.

Finally it is a step in the good direction of some inspection of the practice of pharmacy, by the Board, under state law.

Ann Arbor, Michigan, July 31, 1897.

In accordance with a previous motion, discussion of the above paper was postponed.

Mr. L. E. Sayre read the following paper: "Shall a Compulsory Curriculum be Established in Lieu of Registration by Diploma."

SHALL A COMPULSORY CURRICULUM BE ESTABLISHED IN LIEU OF REGISTRATION BY DIPLOMA?

BY L. E. SAYRE.

At the request of the Chairman of the Committee on Education and Legislation I shall gladly express my notions regarding the above query, or say something bearing upon it. I shall take the liberty of interpreting the term curriculum by what is generally understood as a college course—a systematic course of *training* under competent instructors in pharmacy, materia medica, chemistry, toxicology and such allied branches as are taught in the reputable colleges of pharmacy.

Whatever I have to say upon this topic it will be understood as being said from the standpoint of a college man of course—it is natural that I should view it from such a standpoint. I do not mean by this that I shall allow if possible any prejudice to govern my opinion.

Some one has said "I consider a college training almost indispensable to one who would get along about as well without it, but almost worthless to one who could not get along without it," or in other words a college course is valuable to a bright man and of little use to a dull one. Both of these classes we find in our colleges and both we find, unfortunately, possessing diplomas.

It is a sad fact that there are many of the latter class who are perennial candidates for recognition by State Boards. I presume every college dean, by reference to his file of correspondence, can prove that there are hundreds of such "students" hunting for "snap courses" every year.

These candidates have *managed* "to pass" a kind of a course in a kind of college of pharmacy, but, from the standpoint of the ideal pharmacist and from the standpoint of the exacting public they are worthless and untrustworthy as dispensers of medicine. What can be done in justice to the worthy, competent and well equipped candidate for state board recognition, to meet this almost unavoidable condition and thus to raise the general tone of the service in pharmacy?

It seems to me that in every state the colleges should be in close touch with the State Board of Pharmacy. There should be perfect accord in the one aim to the above end. This means also that the State Association should be equally in articulation. Education and registration both being state matters, why should it be otherwise?

In the State of Kansas, every year there is a committee appointed by the president of the Association, to visit the School of Pharmacy. This committee makes an annual report of the work of the school and of its needs. At the last meeting of the Association by a vote of its members the State Board was recommended in substance to regard the curriculum of the school of the State of Kansas as a possible means of estimating the standard of courses of other colleges from which diplomas were presented to the board as vouchers of competency. I merely mention this to show the recognized dependency of the college upon the State Association, and in time upon the State Board and *vice versa*.

If the interdependence of these factors in education—the college, the State Association and the State Board—can be felt as it should be in every state, and if perfect harmony of action can be instituted it seems to me the time will then be ripe for what I consider the ideal method, namely: The candidate for recognition as registered pharmacist by the State Board of Pharmacy must first have a systematic course of training in a reputable school of a certain standard and must possess a diploma certifying to this fact, and then be examined.

I am aware of the fact that from many points of view this is undesirable but weighing all the arguments *pro* and *con*, I feel that this is the right view; a view I shall not stop to expand but will say briefly one of the strong arguments in its favor is this: The public almost demands it of us. I have talked with a good many of the intelligent laity and I have been surprised at the answers. Ninety per cent. of those with whom I have talked are amazed that this method has not already been adopted. Some have said: "You, as pharmacists, are deceiving the public if this method is not now in vogue."

THE CHAIRMAN: Under the rules the discussion will be postponed until this afternoon.

Mr. Jacobs next read a paper on "Practice and Ownership in Pharmacy."

PRACTICE AND OWNERSHIP IN PHARMACY.

BY JOS. JACOBS.

I have been requested to "define what constitutes the practice of pharmacy," and also to "define and distinguish between to own, open, operate, manage, conduct, direct or supervise a pharmacy. Which, if any, of these provisions should be enjoyed by non-pharmacists?"

A definition of the phrase "the practice of pharmacy," in its widest signification, would be the doing of those acts which constitute the business or avocation of a pharmacist. These acts would be co-extensive with the whole range of conduct lawfully permitted to and enjoyed by a person in society in procuring, preparing and furnishing to others any article, medicine, preparation, compound or appliance to be used for the cure, allevia-

tion or prevention of pain or disease, or individual deformity, or disfigurement in any animate being. But, practically, the practice of pharmacy is the art and avocation of procuring and collecting together of such articles of a medicinal nature and furnishing them for a price to the individuals who need and will use them medicinally. And, I take it, that the intention of the question propounded is really "What acts should be allowed to pharmacists and prohibited to non-pharmacists by the State?"

To answer this question we must inquire what is the reason or necessity for any law on the subject at all, for all laws to be effective and worthy of support should be founded in reason, and be intended to correct or prevent an evil. The evil to be prevented by pharmacy laws mainly lies in the fact that the preparation of natural substances for medicinal use requires expert knowledge and skill, and to leave such preparation to unskilled persons would hazard the lives and health of the people of the State. This is the main evil aimed at, and sought to be overcome, by any pharmacy regulating statute. Another purpose is to secure to the people efficacious and unadulterated medicinal agents and substances for the cure and prevention of disease.

It will then be asked, should not pharmacy laws, to be effective in preventing the evils above-stated, be broad enough to "confine the sale or dispensing of drugs, chemicals and medicines to those alone who have proved their qualifications for such service—the registered pharmacists"—as the Committee says in its circular of questions "is the consensus of opinion?"

Now I would say that that was perhaps going too far, for there are many "drugs and chemicals" that have industrial or other uses besides those which apply to them as medicines, and to prohibit their sale by non-pharmacists to others for use in the industries and arts, would be a restriction upon trade so hurtful to the State that it would be unjust, and as well unjust to the individual citizens who might own these "drugs and chemicals," or who might wish to engage in their "sale" or "purchase and sale" for profit. We must not propose a law that is open to the objection of "class legislation," or that is more in "restraint of trade" than is necessary to the result of effecting beneficence in the nature of "police regulation" and the "preservation of health and morals."*

And I think that a reasonable exception should be made in favor of general merchants being allowed to keep and sell non-poisons and domestic drugs and remedies in original packages, purchased from a registered pharmacist, when those merchants have their stores at a distance of five miles or more from a pharmacy. Reasonable exceptions like this will give reasonableness to the general law, and, on the whole, prove of benefit to the pharmacists.

I have been asked to "define and distinguish between to own, open,

* Such exemptions were provided for in the list of questions of the Committee.—Chairman Section of Education and Legislation.

operate, manage, conduct, direct or supervise a pharmacy. Which, if any of these privileges, should be enjoyed by non-pharmacists?"

The distinction between "opening" a pharmacy, "conducting," etc., is indicated *ex vi termini*, as the lawyers say. No one would "open" a pharmacy without the intention of "operating" it, so there could be no profit in discussing the distinction, and a non-pharmacist should not be allowed to "open" because he might attempt to "operate," and then the damage would begin. It is against the law in our State to point even an "unloaded" gun at another.

To "operate, manage, conduct and supervise" are terms of such close kinship in meaning that they are nearly, if not quite, of the same intent. They practically mean the same, and all should apply to non-pharmacists.

But I would urge objections to restricting non-pharmacists from "owning" a pharmacy. The reasons are numerous why they should be permitted to "own" if they wish, but there are two which it seems to me are conclusive.

In the first place, the law which attempted to prevent a non-pharmacist from owning a drug store would be held to be unconstitutional, since the right to hold and enjoy property in any kind of valuable goods is inherent and fundamental. Let the non-pharmacist hold and own a pharmacy if he wishes, subject to the laws regulating the manner in which he makes a sale of the articles comprising it.

In the second place, our pharmacists as owners themselves, do not wish to hold their property as property which, as a whole, cannot be bought by any one in the trading world. Such a tenure would lessen the value of their property as an investment, should they desire for a good reason to sell or change their business. And many of our profession are vastly benefited by being enabled to employ the capital of non-pharmacists, who, as actual or silent partners, or as holders of shares in joint stock companies, are co-owners with us in the business.

I trust that the great work which the committee is performing may be appreciated by the pharmacists, and that the "Uniform Law" which it may be able to suggest will meet the approval of the "sovereigns" of our land, the voters.

Atlanta, Ga., August 6, 1897.

Mr. H. B. Mason read the following paper, entitled "Concerning the Questions Given in State Boards of Pharmacy Examinations."

CONCERNING THE QUESTIONS GIVEN IN STATE BOARD OF PHARMACY EXAMINATIONS.

BY HARRY B. MASON.

I want to speak again on the all important matter of board of pharmacy examinations. My plan is to separate the active principle of my last year's paper, and give it specific and widened attention. So I shall have

nothing to say of practical laboratory manipulation, which, however, I think necessary to a thoroughly successful examination; nothing to say of physical identification of specimens, which is quite as necessary; and even nothing directly to say of the branches of knowledge of which an examination should be composed. I mean to confine myself, for the sake of greater clearness and force, to a discussion of the character of the oral and written questions asked by boards; and as a result of this discussion I shall formulate a set of principles which I think should govern the formation of every set of questions.

The present average examination is mainly made up, as I think no one will refute, of such questions as ask for isolated, abstract, separate facts. In arguing the propriety of this characteristic, we have only to study its application, first to the "crammer," and next to the competent pharmacist. The "crammer," "I take it, deals exclusively in these detached chips of knowledge. He prepares for the board's examination by looking up all the odds and ends of facts he can find, basing his efforts upon published questions, the quiz compend, and the experience of his friends before the board. No study of the fundamental sciences or branches precedes this cramming of separate facts, and so it is generally but the memorizing of word formulas. If sometimes it is a little more than that, it can scarcely ever be said to be the acquisition of true knowledge. For though in some rare cases the facts may be more or less understood in themselves, they are not conceived in their relation. They can therefore be subject to no intelligent use. There is no generalship behind them that can bring them into combination and direct their movements. But if the "crammer" miss all this, yet he acquires state board merchandise. He fills his bag of memory with that which he shrewdly discovers the board deals in. When he goes up for examination the board asks him for a given fact. He shoves his hand down into the bag and brings forth—the symbol! The board asks for another fact. He hauls forth another symbol. So it goes on. Sometimes a lucky applicant has considerable merchandise left after the barter has been made. But if, on the contrary, his supply has been insufficient, he goes home and fills his bag fuller. If he be successful on his second appearance before the board, the bag's contents are then forgotten. They were extraneous to him, and having served their purpose they pass from him one by one until scarce one remains.

The experience of the competent pharmacist before such an examination is quite different. This applicant, let us suppose, has gone through a systematic course of study in preparation for the duties of his calling. He has gained real knowledge. Facts to him are related to one another, nnd he is used to thinking with them and applying them to necessities. When a dilemma comes which falls outside his previous experience, as they are always coming in true pharmacy practice, he comprehends the situation and proves himself equal to it. He anticipates the dangers of the pre-

scription desk, and avoids them. This man, in brief, is educated. He will go on enlarging with practice. Now, during his regular course of study this student learned the usual species of facts—synonyms, specific gravities, tests, solubilities, therapeutic terms, peculiar and special properties, and the like. But after a year's practice some of these things that he has not had occasion to use, have left him. But he goes before the board and many isolated facts are asked of him. If he have the good luck to have in stock those that are wanted, he gets through; but if, as is very often the case, a majority of those wanted he has either forgotten or has never happened to learn, he fails. In the latter event he goes back home and for a few weeks turns himself into a "crammer," and appears again before the board. He passes. A year goes by, during which time much of the material that he so diligently crammed his mind with has taken unto itself wings, and he goes into another state to practice. The same experience is repeated—the same cramming and forgetting gone through with.

Are these over-drawn pictures? Their fidelity to truth has been taught me by my own experience before three boards of pharmacy, by the experience of my college friends, other acquaintances, and a large number of students with whom I have been in correspondence for some years. And the same thing will be proved by a careful examination of different sets of questions. Last year I cited the case of my college mate, a thoroughly competent pharmacist, who failed to pass one of our supposedly best boards because he was found weak in synonyms and obsolete Latin terms. I will admit that this was an extreme case, but yet I have myself known of several equals before the same board. It is a matter of common experience that a college man stands a much better chance of passing the board directly after graduation than he does two years later. During these two years he has forgotten many separate and unused facts, but I think no one will deny that he is much more competent as a practicing pharmacist after his college-taught knowledge has been supplemented and given its highest value by two years of practice and thought experience. The conclusion is inevitable that there must be something permanent and unforgetable upon which competency depends, that is not well reached by the board's questions; that the board leaves unasked that which is determining of fitness, and asks that which is not.

Reserving for later attention that which the board mainly leaves unasked let us consider that which it does ask—the isolated fact questions which form the character of its examinations. It is very evident that if this kind of question is not to pervert an examination, restrictive and qualifying principles governing its admittance should be given very thoughtful attention, instead of being entirely ignored. What should these principles be? First, few single facts should be asked for; second, those only should be asked for which we find constant and essential use in practice, or which are necessary to the understanding of these; third, they should have a comparative rating based upon their determining values.

First: It has already been shown why but few isolated fact questions should be asked. If allowed to play anything like a predominating part they may, and very often do, seem to prove as competent one who is really incompetent, and incompetent one who is really competent. But even if they had not this vice on the one hand, on the other they have not the virtue of distinguishing between real and spurious knowledge, nor, if the knowledge be real, of deciding at all as to its usability. When, however, only a few are wisely given, and these made to play a subordinate and supplemental part, they serve well to give a more accurate estimate of the applicant's knowledge when you have already mainly decided upon his degree of general fitness.

Second: But of such few isolated fact questions as it is well to ask, it is in strong justice due to the competent pharmacist that only those be among them which have a potent and continual use in every pharmacist's practice, or such as lie beyond the comprehension of these. There are certain general ideas, certain fundamental truths, certain separate facts, that are of such constant application in the practice of true pharmacy as to become literally a part of oneself. They are the very woof and warp of the real pharmacist's being. Now outside of this "essential" knowledge there is a large knowledge which is useful, desirable, and under certain conditions and places of practice, necessary, but which can hardly be called compulsory. Much of this knowledge, like certain of the synonyms, doses, drug properties, specific gravities, and so on, the competent pharmacist has once had in stock, but through a lack of need has partly forgotten; much of it, like certain of the formulas, tests, component parts of compounds and the like, he has not tried to keep in mind, referring to his books when in need of it. Now it is absurd to ask that all these things be kept in memory. Naturally some of them will be, but which of them depends entirely upon the practice and peculiarity of the applicant. It is therefore almost entirely a matter of chance whether he pass an examination in them. The examination may fit him, but it may misfit his just as competent friend, who has in stock a different set. Why ask the things which are not only attended with so much injustice, but are not determinative of fitness? If this applicant be really competent, as you will find by means other than these, he can be trusted to have in ready stock any set or sets of these "useful" and "desirable" facts that any particular conditions of practice may make necessary.

Third: This principle of the comparative rating of questions was brought out by Professor Remington in the discussion last year. Every question, whether of separate fact or not, should receive a rating in accordance with its value to determine fitness. Some questions deserve many times the rating of others. In general, I think it may be said that questions of separate fact should receive comparatively small ratings, for reasons already given and others yet to be considered.

But if the use of the isolated fact question is to be limited by these principles, what is the body of the examination to be made up of? It should be made up, certainly, of such questions as determine the applicant's fitness to meet the many demands and exigencies of practice. The isolated fact question has been found not to do this. But there are two kinds of questions which will—the speculative question, and the question demanding combination of fact, or application of knowledge.

These two kinds of questions share one another's virtues, though in different degrees. The speculative question best shows the applicant's wisdom and judgment. When you ask an applicant what course he would follow in a given case—a duplication of some practical exigency—you are going to find out pretty well what are his precautionary qualities, his trained foresight, his reasoning power, his independent thought, and his general all around properties. And these are the things that have most to do with competency. To develop them is the chief office of knowledge and experience. Without them no one should be allowed to practice pharmacy. They are well determined by the speculative question, which, in brief, shows what a man is in himself, rather than what he may hold in mechanical retention. This kind of question is noticed in some board examinations in the shape of prescriptions given for criticism, but it is not made to play the determining part that it should. The perspective of the examination should be so changed as to bring the speculative question into the foreground, and to sink the isolated fact question into the contributory background.

If the speculative question tests best the applicant's general qualities, the question demanding combination of fact is excellently adapted to show in better detail just what kind of knowledge the applicant possesses. It has the great advantage over the isolated fact question in readily distinguishing between real knowledge and the make believe, and in showing whether knowledge, though real, is usable, is applicable to necessities. You ask an applicant, first, the number of drops in a fluidram of laudanum; second, the dose of laudanum, and third, the percentage of opium laudanum contains, and he may very readily answer two if not all three of these quiz-compend or isolated fact questions. But this apparent knowledge may quite likely be unreal, or if real, not applicable to the purpose. If, however, you get at it in this way you are reasonably sure to find what its value is: If you were called upon to prepare a four-ounce "teaspoonful" mixture, of which laudanum was the main ingredient, how much laudanum would you use, and after preparing the mixture, how much opium would there be in the bottle? There are many forms of this kind of question making necessary the application of knowledge; among them are problems in percentage composition, in specific gravity and in alligation. It is by thus making the applicant combine and direct his knowledge, as he has to do in practice, that you can tell the spurious stuff of the incompetent "crammer" from

the real and usable knowledge of the real pharmacist. Then bring the question which makes this necessary forward into the perspective with the speculative question.

But here again, with these two types of question, the rights of the applicant must be considered. It is unfair to ask him for knowledge that is not highly essential. If by the speculative question you find him possessed of the necessary natural and acquired qualities, and by the question both of separate and of combined fact find him possessed of really essential and usable knowledge, you should be satisfied of his competency. If inexcusably you go farther and ask for unessential knowledge, in the sense that it is herein somewhat arbitrarily classified, you are treating him with injustice. I am not arguing for the rule-of-thumb man who travels in, and cannot get out of, a well-worn groove of empirical knowledge. On the contrary, I am arguing for a full knowledge, thoroughly learned, well comprehended and suggestive. But the best test, and certainly the greatest value of such a knowledge is the development of the pharmaceutical faculties. These faculties will remain, but different bits of the knowledge itself that have not some use, remote or near, will escape the memory. And though he of the developed faculties will continue to acquire knowledge, in the main it will be only such as he finds to be necessary in his practice. At any rate, if you confine yourselves pretty closely to a duplication of the exigencies of that practice, considered in its best average, sometimes ideally considered even, and the applicant does what you ask of him, you are finding him capable of doing what it is your function to examine him for.

Briefly, a pharmacist should be made to show fitness to serve the public's needs safely and capably. This implies more than mere possession of arbitrary facts, or even of knowledge itself. Unless the knowledge, mixed with experience, has been transmuted into trained judgment, reasoning, speculation, anticipation, it has failed to make a pharmacist. It is what the pharmacist is, more than what he has, that speaks of his value. An overloaded memory indicates no fitness; indeed, it often indicates unfitness, for when "memory prevails the solid power of understanding fails." And certainly it is indicative of unfitness when it is the result of unintelligent "cramming" for the examination. Such questions, then, should be asked as require the use, first, of trained pharmaceutical faculties, and next, of such knowledge only as is likely to be retained in the mind by its constant application. Questions dealing with memory alone should be subjugated instead of given precedence. Then an examination would demand of a pharmacist just what practice does, and if really competent he would be able any minute to step from behind his prescription desk and pass it. He would be put to no necessity of acquiring the difficult art of preparing for an examination, and would be relieved of the injustice of going through a special "cramming" process for months. And the quiz

compend student, skilled in the art of preparing for the examination but woefully deficient in the art of preparing for practice, would find himself wallowing beyond his depth.

Applause.

MR. GOOD: It does seem to me that now is the proper time to discuss this paper. I move that the paper be received.

Motion seconded and prevailed.

MR. LYONS: Mr. Chairman, I am glad that opportunity has been given for discussion of this paper, because it is a very important one. I have only one suggestion to offer as to the character of questions which may be used very profitably. It seems to me that the qualifications of a man for any work to-day depend very largely on his ability to use the laboratory, and so it seems to me it would be very desirable to demand from the candidates that certain questions be answered—questions of no great difficulty perhaps, but refer to a few books which are on the shelves, ask these questions and then have them look in the book for the information. Ask for a short paper, one page, on the subject of some particular active principle of a drug—questions of that sort which the candidate is not expected to be familiar with, perhaps has not paid any attention to them in the past, but here is the opportunity to use the books and show his ability to do so.

MR. FEIL: I have for many years been a believer in the things stated in this paper. I believe we can teach a great deal more of science now in one year than we formerly could in two years, by directing the student's attention to the essential part of the subject. I think that paper is just about right in that direction.

MR. HELFMAN: Mr. Chairman and gentlemen, some two years ago I had the privilege of reading a paper which gave me the first intimation that people were becoming alive to the fact that there is such a thing as a science of examining. This paper was by Peter T. Austen, an accomplished chemist of Brooklyn, and in it he made an able plea for such methods of examination as should enable the examiner to gauge the mental power of the person examined, and, naturally, he pleaded for the exclusion, the elimination of those questions which tend to gauge only a man's capacity for memorizing. Now, I am very glad to see a movement along these lines. There is such a thing as a science of examining, and the construction of a clever examination paper I claim to be one of the most delicate and difficult things that comes to the minds of the examiners. In England they have given up the idea that there is any exclusive salvation in the examination paper, and they haye come to the conclusion that those papers which only bring forth the cramming capacity of the student are thoroughly vicious.

MR. OLDBERG: Mr. Chairman and gentlemen, one of the greatest difficulties that the state board of examiners have to contend with, I assume, is that they do not devote sufficient time to the examination under existing conditions. If the state boards had proper rooms for the examinations, books, apparatus, materials and everything needful to give better examinations, we would have better examinations. Most of them hold their examinations in one place one time and the next time in another place, one time in a hotel and another time in a barn, and they write a number of questions, chiefly memory questions, then they want to get through just as rapidly as possible in passing upon the answers to these questions. Now, if the examinations are such as they ought to be, they will most assuredly consume considerable time and will involve considerable labor on the part of examiners. Are the examiners compensated for that labor? No, I don't think they are under the existing conditions. There are a good many things that they

should do. Let them try and find how they can work in other directions besides simply making emulsions.

MR. WHELPLEY: I believe we should go a point still further, and consider the ability of the members of the Board to examine. I think the necessity of going behind the returns is really the key-note to the situation, without in any way reflecting upon the Boards of Pharmacy of the United States. I believe it is a fact that in many states the system of selecting the members on the Board is not calculated to bring to the Board the best material obtainable for board examiners. It requires a peculiar ability coupled with experience in order to determine just what a candidate is in the way of a practical pharmacist: something more than has been pointed out in the mere answering of questions and identifying the drugs; but the examiner must be competent to read between the lines in a written examination, to catch the inflection of the voice, the expression of the face, the manner in which the question is answered or missed. Oftimes the applicant will miss a question, and the manner in which he misses it shows that he knows more about it than another applicant who answers it correctly, so far as words are concerned, and I think the pharmacists of the United States should especially direct their attention to the selection, or to laws and conditions that will bring about the selection of the most eligible material possible for our boards of pharmacy.

MR. FLEXON: Mr. Chairman and gentlemen, the province of Manitoba has a pharmacy law embraced in a charter which has been granted by the provincial government. It is an act, a complete act of the pharmacy law for the guidance of the pharmacists in that province. We have no such thing as a board of pharmacy governed by the state, but we have the complete college course. The lectures, comprising two courses, are conducted by the pharmaceutical association in their college, which is in connection with the medical college, and the by-laws, of course, are made by the council of the pharmaceutical association. We have a complete syllabus of study. The curriculum is set forth in the pamphlet which I have laid on the table there, and the medical college announcement, which is published every year. There can be no possible mistake of a man not being thoroughly trained under the curriculum as there set forth. We have three examinations; the preliminary examination is a very rigid one, and it is utterly impossible for a young man to escape it, and he must pass that examination before he can even enter as an apprentice. After being certified as an apprentice, and serving two years in a drug store, he then appears for his minor examination, which is by no means an easy one. The curriculum is very distinctly laid out in that college announcement. Then he must put in another two years in a drug store, and then go up for his major examination. In other words, he must have served four years in a drug store before he can go up for his major examination. Very recently the lecture courses have been altered so that they run concurrently, the minor course beginning in September and finished in December, and the candidate then goes up for his minor examination, and, if successful, can go on with his major lectures and then go up for his major examination.

THE CHAIRMAN: The Chair desires to state that the Manitoba law is the same as the pharmacy law of Great Britain, with the compulsory curriculum features added, which hey have been working and waiting for in England itself for so many years, while they have it substantially in the Dominion, and even in Victoria and some other colonies, but the old mother country has not got the compulsory curriculum which the colony already has.

Mr. Prescott, chairman, read the following report of the Committee on Chairman's Address:

REPORT OF COMMITTEE ON CHAIRMAN'S ADDRESS.

The Committee to whom was referred the address of the Chairman of this Section, beg leave to submit the following:

We agree fully with the Chairman as to the first, third and fourth recommendations made by him, and recommend their adoption, namely:

1. That the preliminary educational requirements for apprentices be continued to the state associations for report next year.

3. That the feasibility of the creation of some sort of memorial of Hermann Hager be reported upon at the next annual meeting.

4. That a set of rules for division and conduct of the work of the Section be presented next year for adoption and incorporation in the By-laws.

We do not recommend the adoption of the second recommendation for the reason that the proposed changes in orthography of chemical terms are already well known to the pharmaceutical public, that their introduction into use will be governed by private judgment and taste in the growth of languages, and the discussion of the subject by this Section would be likely to consume an amount of time that cannot be spared.

A. B. PRESCOTT,
G. W. PARISEN,
W. A. PUCKNER,
Committee.

MR. EBERT: I move that the report be adopted.

Motion seconded and prevailed.

The nomination of officers being resumed, Messrs. Webster and Puckner were named for Secretary by Messrs. Ebert and Hereth respectively. Both nominations were duly seconded.

On motion the meeting adjourned to meet again at 2 o'clock, p. m.

SECOND SESSION—FRIDAY, AUGUST 27, 1897.

The Section was called to order at 2:30 o'clock by the Chairman, who at once proceeded to read the Report on the Revision of the Pharmacy Laws:

REPORT ON THE REVISION OF THE PHARMACY LAWS.

As will be observed from the summary to the answers received in response to the interrogations, and herewith submitted, there is practical unanimity on all the minor details. The fundamentally important consideration for an act to protect the public against incompetent service in the preparation and dispensing of drugs, chemicals and medicines, resolves itself into the following propositions:

Shall the exclusive privileges of pharmacists to prepare, compound and dispense drugs, chemicals and medicines, be limited to poisons and poisonous substances?

Shall there be two classes of pharmaceutical establishments; upon what conditions shall the distinction be based?

Shall any one but a registered pharmacist have the right to own a pharmacy or drug store?

What shall be the requirements for registration, with definition of titles and privileges?

What articles, for which purposes, and what persons shall be exempt?

Shall the act contain an adulteration section or is a separate statute preferred?

Since the intent and purpose of a pharmacy law is to protect the public against faulty preparation, careless compounding and ignorant dispensing, its restrictions must necessarily be chiefly upon the practice of pharmacy as relates to such drugs, chemicals and medicines as from a lack of experience, care and knowledge in their preparation, compounding and dispensing may be hurtful to the public health; in other words, substances having poisonous or deleterious effects upon the human system, unless carefully prepared and compounded and intelligently administered.

That such practice should, therefore, be confined to those who by experience, education and training are qualified to perform such service, is one of the most important functions of a government, an essential duty of society and the strongest evidence of civilization.

It comes also more completely within the scope of the powers delegated to the states by the Constitution of the United States than any other power of which we have knowledge. These inherent powers of the state:

1. The preservation of health;

2. The protection of the morals;

3. The maintenance of the police power, are all so fundamentally concerned in the protection of the people against dangerous drugs and medicines that there can be no question as to the desirability, nay necessity, of the state exercising its full power therein. This being conceded by every civilized country, by courts in our own country, who have upheld the principle wherever opportunity has afforded, the question is resolved into the query:

Where shall the line be drawn? What substances should be sold exclusively by pharmacists, or what constitutes "poison or poisonous substances?"

Upon this question there is much difference of opinion; even authorities do not agree. Nor is it possible that medical science will ever be in a position to definitely determine where, when or how every article of the materia medica may produce untoward or dangerous effects in that "fortuitous concourse of atoms"—the human body—in all its varied stages of activities and conditions.

There is a safe rule, however, old as civilization itself, that when any substance administered or taken internally by an average full-grown person, in quantities of one teaspoonful or less, produces such effect upon the human system as to endanger life or impair health, then such substance is a *poison* or may be classed as a *poisonous substance.*

As far as we know, whenever the courts have been called upon to define a poison, it has been defined on these lines. The Supreme Court of Pennsylvania and the Courts of Great Britain have rendered this interpretation of what constitutes a poison or poisonous substance.

Proceeding upon this basis then, an act to protect the public against the ignorant, careless and criminal use of poisons and poisonous substances must confine the preparation, compounding and dispensing of such drugs, chemicals and medicines that come within the scope of this definition, to those who are by experience, education and training qualified to so protect the public—the pharmacist—with such exemptions for their use in the arts and industries as may be required by public policy under proper restrictions and regulations.

Since such restriction requires dealing with substances in the concrete it necessitates a classification of drugs, chemicals and medicines based upon their toxic properties or potencies, for incorporation in any such act.

Such classifications are found in most pharmacy acts, as poison schedules A and B, but these are neither adequate nor scientifically constructed, and, for these reasons, a new classification has been presented.

Such classification is somewhat tentative, owing to the absence of any standard author-

ity as to the potencies of many substances, but, nevertheless, it is believed will fairly represent the central idea. As far as the official substances are concerned the medical and pharmaceutical professions seem to favor a standard of doses in the U. S. Pharmacopœia, so that official substances would be provided for by the incorporation of such tables in the next revised edition of the U. S. Ph., 1900. With such standard for comparison the Pharmacy Boards could add and revise the list of unofficial substances from time to time.

CLASSIFICATION OF ARTICLES.

Class A: Comprising substances commonly called "Violent Poisons." To be sold or dispensed only upon physicians' prescription, except in such form, preparation or mixture as come within the limitation of strength and dosage herein prescribed (exempt from poison label when dispensed).

Violent Poisons.

Acids—Arsenous; Carbolic (1, 2) (pure); Chromic; Hydrocyanic.

Arsenic compounds and preparations (1, 2, 3).

Chloroform; Chloral; Glonoin, or Spirit of Nitroglycerin.

Drugs, animal or vegetable substances, crude, purified or powdered, the average dose of which does not exceed three decigrams (0.3) or 5 grains; and all preparations of these containing or representing more than three decigrams (0.3), or 5 grains, in five (5) Cc., or 80 minims (an average teaspoonful); or in five grams (5.0), 78 grains.

Aconite, Belladonna, Cantharides, Colchicum, Colocynth, Conium, Digitalis, Elaterium, Gelsemium, Hyoscyamus, Nux Vomica, Opium, Physostigma, Stramonium, Strophanthus, Veratrum, white (1, 2, 3) and green.

Alkaloids, and other principles of the above drugs and their salts, and all preparations of these containing one (1) per centum or more of such alkaloidal salts or active principles.

Also the following alkaloids and active principles and preparations containing one (1) per centum or more of these: Cocaine, Elaterin, Picrotoxin, Pilocarpine, Sparteine, Veratrine.

Phosphorus and preparations containing more than one (1) per centum of Phosphorus, except phosphorus rat paste (1, 2, 3).

Abortifacient, Ecbolic or Oxytoxic Remedies; Ergot, Cotton Root Bark, Potassium Permanganate; Oils of Pennyroyal, Rue, Savin, Tansy.

Antitoxin, Serums.

Exemptions, to be sold when properly labeled by: (1) pharmacists, by (2) druggists, by (3) licensed dealers.

Carbolic Acid not to exceed 25 per cent. strength for disinfectant and deodorant purposes.

Compounds of Arsenic and Copper, *i. e.*, Paris Green, Brunswick Green, Scheele's Green, and London Purple, also White Hellebore, exempt by special provisions for sale of Insectides. (See Class B.)

Class B: Comprising substances commonly called "Mineral" or "Corrosive Poisons."

Acids: Carbolic, crude (2); Hydrochloric; Nitric; Nitro-hydrochloric; Oxalic; Sulphuric.

Alkalies, Caustic; Potash and Soda (2, 3) preparations, including Aromatic Spirit of Ammonia.

Antimony Compounds; Copper Aceto-Arsenite (Paris Green) (2, 3).

Bromine, preparations of; Bromides, preparations of and compounds.

Creosote; Chloroform, commercial (2); Cyanides; Ethers (2).

Iodine, preparations of; Iodides, preparations of and compounds.

Lead salts, compounds and preparations of (except Carbonate, Cerate and Water of Subacetate and Lead Plaster) (2).

Mercury, compounds and preparations of (except Mercury with Chalk, Mass, Ointment, Citrine Ointment, Oleate, Plaster and Calomel) (2).

Methyl derivatives, compounds and preparations.

Oils; Almond, bitter; Croton oil.

Phenyl derivatives, compounds and preparations.

Silver nitrate, compounds and preparations.

Tin chloride and preparations.

Zinc salts, compounds and preparations of (except Carbonate, Oxide, their ointments, and the oleates) (2).

To be sold or dispensed by pharmacists only, except as noted, by (2) druggists, and (3) licensed dealers.

To be sold or dispensed only to persons not less than sixteen years of age.

To be distinctly labeled "Poison" (except that ethers should bear a label of caution against inflammability).

The label must name the most common antidote or antidotes, describe their administration, and give the usual methods to be employed in case of poisoning.

Liquids must not be dispensed in bottles commonly used for mineral waters or beverages.

The following rules are to be observed in dispensing the articles enumerated, except that when prescribed by physicians all further obligations cease upon filing the original prescription.

Rules for Recording Sales:—

The article must not be delivered unless the pharmacist is satisfied that the purchaser:

(*a*) Is fully aware of its poisonous character and understands its use;

(*b*) That the article is to be used for a proper purpose.

The following entries must be made in a "Poison Record," a book substantially bound and used for no other purpose:

The name and address of the person who is to use the poison, in his own handwriting.

The name and address of the purchaser, if not identical with the first mentioned, in his own handwriting.

The date when bought (the hour).

The name of the poison and the quantity.

The purpose for which it is said to be used.

The name of the dispenser or seller.

The Poison Record must be kept for a period of five (5) years.

It is part of the assets of the pharmacy, and must not be taken away or separated from the stock or establishment.

The Poison Record is a public record, and must be accessible to the proper authorities of the state, county, town or village.

Class C.—Potent Drugs:

Drugs, animal or vegetable substances, crude, purified or powdered (not comprised in Class A), the average dose of which does not exceed two gm. (2.0), or thirty (30) grains, and all preparations of these containing, or representing, more than two (2) gm. (2.0), or thirty (30) grains, in five (5) Cc. or eighty (80) minims (an average teaspoonful); or, if solid, in five (5) gm., or 78 grains; including fluid extracts, half-strength fluid extracts (50 per cent. tinctures), extracts, resins, active principles, and all preparations containing or representing 40 per cent. or more of the following drugs:

Absinthium,	Aspidium,	Capsicum,
Aloes,	Aspidosperma,	Caulophyllum,
Ammoniac,	Bryonia,	Chelidonium,
Apocynum,	Cambogia,	Chrysarobin,
Asafetida,	Camphor,	Cimicifuga,
Asclepias,	Cannabis Indica,	Coca,

Convallaria,	Juglans,	Rheum,
Cypripedium,	Kamala,	Rubus,
Dulcamara,	Leptandra,	Sanguinaria,
Euonymus,	Lobelia.	Santonica,
Fel Bovis,	Lupulinum,	Scammony,
Granatum,	Mezereum,	Scoparius,
Guaiac,	Myrrha,	Senega,
Guaiaci Resina,	Phytolacca,	Serpentaria,
Hydrastis,	Pilocarpus,	Squill,
Ipecac,	Podophyllum,	Viburnum,
Jalap,	Quassia,	Zingiber.

While the first two classes may be considered sufficient, there is a large class of potent or toxoidal drugs over the sale of which there certainly should be some restriction. The Class C represents such drugs and their preparations, the average dose of which should not exceed one teaspoonful, leaving the tinctures less than 40 per cent. strength to be sold by the druggists. The chief value, however, of such classification, lies in the following provisions, which have been substantially in force for several years in Colorado and Virginia.

LABELING OF PROPRIETARY MEDICINES.

The Board of Pharmacy having determined that any proprietary medicine contains poisonous or potent substances of the character indicated in the Class A, B, and C, respectively, in such quantities as to make its use unsafe, shall have the right to attach an external label to each box, bottle or package, cautioning against the prolonged, immoderate or otherwise improper use of such medicine in order to permit its sale in the State, except when sold by pharmacists or druggists.

LABEL PROVISIONS.

The Classes A, B, C, are exempt from label provisions when dispensed on physicians' prescriptions, except when prescribed in such form or strength that a teaspoonful may not be taken without damage (Fowler's Solution, etc.)

Indicating dangerous character of the medicine, to guard against overdose, and to keep removed from children.

"For external use."

For gargles, injections, etc. "Not to be taken internally."

TWO CLASSES OF ESTABLISHMENTS.

It is believed that taking the vast area, the varied character and density of population, of the different states, into consideration, in order to improve the status of pharmacy, it is necessary that there be a gradual separation of the practfce of pharmacy from what is commonly called the drug business.

The question is how can this be best accomplished, that injustice be done to no interest and only the highest good to society may be promoted?

In the first place, let it be understood that it is not proposed to infringe upon any one's present right; pharmacal legislation has often been opposed by persons in business because they feared it would interfere with their rights and privileges. All well-informed persons should know that every law contains provisions whereby those affected may comply with its requirements before such law takes effect.

Although those favoring the proposition that only a registered pharmacist should own a pharmacy were greatly in majority, as shown by the returns, still the great legal principle involved and the legislative obstacles presented render a compromise desirable.

If the two classes as above indicated be given the exclusive right to the respective

titles and the privileges of the practice of pharmacy as defined, it would perhaps afford adequate protection to the public.

It would require, through additional provisions, the names of the individual persons enjoying the privileges of the respective titles to be exhibited on all signs, prints, etc., in order that responsibility may q϶ defined when necessary for the protection of the public. The collection and identification involves purchase of and payment for the drugs, chemicals and medicines employed, and would bring that lofty personage "the buyer" of an establishment within the scope of the practice of pharmacy.

Practically, the proposition would be that a certain time after the enactment of the proposed law (1900) there would be two classes of establishments for the sale of drugs, chemicals and medicines, viz.: (1) Pharmacy, and (2) Drug store, and two classes respectively of qualified persons (1) Pharmacists and (2) Druggists.

Registered Pharmacists to have the sole right to take, exhibit and use the titles "Pharmacist" and "Pharmacy," for only one pharmacy or drug store at one and the same time.

Also to have the sole right *to practice pharmacy*, that is, to exercise all the functions of pharmacy, *i. e.*, the collection, identification, valuation, preparation, compounding and dispensing of all drugs, chemicals and medicines.

Registered Assistant Pharmacists to have the sole right to take, exhibit and use the title "druggist" and "drug store" and also the sole right to practice *limited* pharmacy, that is, the collection, preparation, compounding and dispensing of all drugs, chemicals, and medicines not included in the classes A, B and C. designated as "Violent Poisons," "Corrosive Poisons" and "Potent Drugs," respectively (as proposed in the classification).

Provided that a pharmacist shall have the right to exhibit and use all the titles and privileges of a "druggist."

Provided also that a "druggist" has the right to practice pharmacy also with A, B and C., under the supervision of a "pharmacist" with this privilege extended in temporary absence of pharmacist (for two to twenty-four hours).

Registered Apprentice to have the sole right to take, exhibit and use the title "Assistant druggist," to have the right to prepare and compound all drugs, chemicals and medicines not included in the classes A, B and C, under the immediate supervision or direction of a "druggist" or "pharmacist." To have the right to take charge of a drug store in the temporary absence of a druggist, to dispense and sell all drugs, chemicals and medicines, not included in the classes A, B and C, after having had two years' experience as a registered apprentice under a druggist or pharmacist.

EXAMINATIONS—REGISTRATION REQUIREMENTS

Registered Apprentice or "Assistant Druggist."

Any person becoming apprenticed in pharmacy, shall within thirty (30) days after having engaged in such employment file with the Board of Pharmacy, a certificate showing the schooling required, which must not be less than that required for the High School.

Registered Assistant Pharmacist or "Druggist."

A theoretical (written) examination, equivalent to a standard junior college or school of pharmacy examination.

Practical work in dispensing and compounding.

Identification of specimens, materia medica, chemical, pharmacal.

Oral examination in simple prescriptions, toxicology, dosage.

Experience in pharmacy two (2) years, age eighteen (18) years, in order to be eligible to examination to present evidence of sufficient schooling, either by examination or by grammar school certificate for admission to high school; or evidence of having satisfactorily finished one term of at least six months at a school or college of pharmacy, in order to be eligible for examination by the Board of Pharmacy.

Registered Pharmacist or "Pharmacist."

A theoretical (written) examination equivalent to a standard senior college or school of pharmacy examination.

Identification of specimens of materia medica.

Identification of specimens of materia medica, microscopic.

Identification by reagent of chemicals.

Identification by reagent of alkaloids, etc.

Identification by reagent of pharmacal preparations.

Practical work in dispensing and compounding.

Oral examination in prescriptions.

Oral examination in toxicology and dosage.

Age 21 years, experience in pharmacy four (4) years, two (2) of which must be as a registered assistant, with deduction of not to exceed one year, if proved attendance at a college or school of pharmacy for such period, or evidence of having satisfactorily finished a course of at least two (2) terms of six (6) months each at a college or school of Pharmacy in order to be eligible for examination by the Board of Pharmacy.

EXEMPTIONS.

With two classes of establishments selling drugs, chemicals and medicines, but little necessity would exist for their sale at retail by other dealers. The Board should, however, have the right to issue annual license, revocable, for a fee of five (5) to ten (10) dollars, to general dealers in villages where no drug store or pharmacy exists within a radius of five (5) miles for the sale of such drugs, chemicals and medicines as the Board may prescribe, provided that such bear the label of a registered pharmacist of the state.

Manufacturers and wholesale dealers are exempt:

From provision of Class A, "Violent Poisons," when selling Class A to registered pharmacists, except as to special label provisions.

From registration provisions of Class B when selling to registered pharmacists, and also in original packages, or in quantities larger than usually kept in a pharmacy, to persons whose identity is known, for use in the arts and industries.

Druggists are exempt from provisions, and may sell chloroform and ethers for solvents, crude carbolic acid, and 25 per cent. solution of carbolic acid.

Druggists and licensed general dealers may sell the following if in original packages, under proper restrictions.

Caustic Alkalies, Potash, Lye, and the following insecticides: White Hellebore, Arsenical Compounds, Brunswick Green, Paris Green, Scheele's Green, London Purple.

ADULTERATION SECTION.

From experience of Pharmacy Boards in enforcing the law, it seems desirable that the pharmacy law should have a provision for adulterations in drugs, chemicals and medicines. These substances can best be defined as to their identity, purity and strength by pharmacists.

Since the pharmacy law is for the protection of the public, and the Board is charged with its enforcement, it should also be empowered to protect the public against sophisticated and impure drugs, chemicals and medicines, as well as such as do not within reasonable and just limits respond to the official requirements in quality and strength.

(Applause.)

MR. THOMPSON: Mr. Chairman, I move that the report of the committee be received.

Motion seconded by Mr. Stewart and prevailed.

MR. SHEPPARD: Mr. Chairman, I think that in order that this paper may do the most

good it needs to be very widely circulated. The idea of a model pharmacy law is one that will have to grow very slowly, and the only way to stimulate this growth is to continually spread abroad all the ideas of a general sort that can be evolved. Now we have a great many ideas in this paper, and they are condensed to a certain degree. I make the motion, Mr. Chairman, that the Association be requested to have printed five hundred copies of this paper for the use of the Chairman of the Section on Legislation, and that the Chairman be authorized by the Section to send them, when printed, to every college, every State Association, and every Pharmacy Board in the country, with any communications that he thinks should accompany it in order that the idea may be spread out broadcast all over the country.

Motion seconded.

MR. WHELPLEY: Mr Chairman, as I understand this motion these reprints are for the use of the incoming Chairman of the Section, that is, practically continuing the work in the hands of that Chairman, which at first thought occurs to me as the proper course; but when I come to realize the immense amount of work that has already been done in this direction by the present Chairman, and the difficulty of breaking this work off and placing it in other hands, a great deal of the experience that has been collected in this work is lost, and it seems to me that it would be well to change the motion sufficiently to provide for the continuation of Prof. Hallberg as a special committee for that work, and bring it before us again in the revised form that would result from a compilation of the comments returned in answer to these reports.

MR SHEPPARD: Mr. Chairman, I think that the same result might be accomplished by appointing subsequently a committee with Prof. Hallberg as chairman, to continue the agitation of the subject, but it seems to me that the official work of distributing should be kept within the hands of the officers of the Section as official business.

Motion was here put and prevailed.

Upon motion of Dr. Stewart, duly seconded, it was voted that the Section proceed to the election of officers.

The Secretary read the names of the gentlemen who had been nominated at the morning session.

THE CHAIRMAN: Gentlemen, the present incumbent desires to withdraw his name; in fact, he did not hear it mentioned this morning.

MR. EBERT: Mr. Chairman, I move that the Secretary be instructed to cast the ballot of this Section for Mr. Beal as Chairman.

Motion seconded by Mr. Helfman and prevailed.

The duty having been performed by the Secretary, Mr. J. H. Beal was declared duly elected Chairman of the Section for the ensuing year by the Chairman. (Applause.)

MR. EBERT: Mr. Chairman, I hope the name of Mr. Webster will not be withdrawn. He will be the right man in the right place. I therefore move that Mr. Webster be made the unanimous choice of this Section on Education and Legislation for Secretary, and the Secretary cast the ballot for him.

Motion seconded and prevailed.

This duty having been performed by the Secretary, the Chairman declared Mr. Webster elected as Secretary of this Section for the ensuing year.

MR. STEWART: I move that we proceed to the discussion of the Report on Revision of the Pharmacy Laws, if we have time.

THE CHAIRMAN: That is taken as the sense of the meeting.

On motion of Mr. Oldberg, seconded by Mr. Whelpley, it was agreed not to discuss the report now, and that the 500 copies of the report to be distributed be accompanied by the statement that the same has not yet been adopted by the Association, and is circulated for study only, to be taken up again at the next annual meeting; furthermore, that all who receive a copy of the report be urged to send an expression of their views to the chairman of this Section.

On motion, duly seconded, it was voted to adjourn until the next morning at 10 o'clock, and that the officers be installed at that time preliminary to the reading of the papers, and the Section did adjourn.

THIRD SESSION—SATURDAY, AUGUST 28, 1897.

The Section was called to order at 10:30 o'clock a. m. by the Chairman, and the reading of the minutes of the previous session called for.

On motion of Dr. Stewart, duly seconded, the reading of the minutes was dispensed with.

THE CHAIRMAN: We will now proceed to the reading of a few papers. The first one will be "Statistical Report on the Use of the Metric System in 233,000 Prescriptions," by Dr. H. M. Whelpley.

MR. WHELPLEY: I will not burden you with listening to the detailed statistics of this paper, but will simply read the introduction.

STATISTICAL REPORT ON THE USE OF THE METRIC SYSTEM.

BASED UPON 233,000 PRESCRIPTIONS.

BY H. M. WHELPLEY, PH. G., M. D., ST. LOUIS.

A measurement of the gravitative force and the determination of the magnitude of material substances constitutes a major portion of the manual training of the apprentice, and continues prominent in the practice of the retail druggist's profession. The theory, as well as the practice of pharmacy, is largely dependent upon deductions and results obtained by the act of weighing and measuring. It is not surprising, in view of these facts, to find the representative body of druggists of this country, the American Pharmaceutical Association, practically considering the various systems of weights and measures, more than forty years ago. The Committee on Weights and Measures reporting in 1857 (see page 36 of Pro-

ceedings for that year) proposed a decimal system for the consideration of the Association as a substitute "for the various systems known as apothecaries', avoirdupois," etc. In way of an apology for so radical a step the committee says: "The labor saved in all the various operations in the laboratory will be almost incalculable, and the immense saving in compensations of all kinds in commercial transactions cannot be counted." The report closes with the prophetic assertion that "the reform will not be the work of to-day, perchance not of our day, but it will be made in due time; for it will be a demand of the age, and generations to come will bless the labors of such as shall be instrumental in conferring so great a boon upon their youth."

This committee outlined the metric system (which it designated as the French system), but objected to the Greek words and Latin syllables, The decimal system which the committee proposed was the one which had just been devised by M. Lefferts, Chairman of the Committee of the New York Chamber of Commerce, and approved by the American Geographical and Statistical Society. It retained the old terms, thus making ten grains equal one scruple, etc. The Association did not see its way clear to endorse the system, but continued the committee after increasing its membership from three to five.

In 1858 we find the committee, through a new member, objecting to the hybrid system and favoring the metric system, with the suggestion that only four of the eight weights be used (*i. e.*, centigramme, gramme, hectogramme, myriagramme). We are practically following out this recommendation in our practice to-day. The spirit of the times is indicated by the volume of Proceedings of the 1859 meeting of the A. Ph. A., which devotes 101 pages to the report of the Committee on Weights and Measures. The subject has received attention at almost every meeting of our Association since that time.

The adoption of the metric system by the United States Pharmacopœial Convention of 1890, and its progress in American laboratory and analytical work, is familiar to those who keep abreast of the pharmaceutical times.

The extent of use of the metric system in prescription writing is more difficult to determine, and does not necessarily keep pace with its progress at the hands of pharmacists. The following statistics are not only interesting, but should, I believe, be permanently recorded as a part of the history made by the metric system, as it gradually, but positively, displaces the older and more cumbersome so-called systems of weights and measures.

Reports were made by 233 pharmacists, representing 191 cities and towns, scattered through thirty states and territories. In ratio of metric prescriptions, Gypsum City, Kans., leads the list with a percentage of 100, Wells, Minn., comes next with 97.6, while Kirwin, Kan., and Hamilton, O., follow with 95.6 and 94.7 respectively.

The average of metric prescriptions out of the 233,000 is 6.27 per cent.

The following statistics have been gathered during the past twelve months.

Many of the druggists responding to my request for information volunteered comments on the use of the metric system. These lead me to believe that the pharmacists are ready to fill metric prescriptions in many places where the physicians fail to write them in that system. By extended correspondence and conversation with members of the medical profession, I find quite a general feeling that it is not safe to use the metric system, on account of the ignorance regarding it on the part of the pharmacist. This being the case, each druggist should strive to let the doctors in his neighborhood know that he is ready and prepared to fill all metric prescriptions with accuracy and dispatch.

Cities.	Per Cent.	Cities.	Per Cent.	Cities.	Per Cent.
ALABAMA.		Florence	0.0	Pekin	16.3
		Ft. Collins	0.0	Peoria	5.
Woodlawn	0.0	La Junta	0.1	Peoria	0.3
		Manzanola	0.2	Peoria	14.7
ARIZONA.				Percy	0.5
		ILLINOIS.		Percy	0.0
Nogalese	29.			Saybrook	0.0
		Alton	0.0	Tiskilwa	9.
ARKANSAS.		Alton	0.0	Troy	0.0
		Athens	0.1	Troy	0.0
Benton	0.0	Bloomington	0.0	Urbana	0.2
Bentonville	0.0	Bloomington	0.2	Vienna	0.0
De View	0.0	Camp Point	0.5	Waterloo	0.0
Fort Smith	0.0	Carbondale	0.0	West Chicago	0.0
Little Rock	0.1	Carbondale	0.0	Woodlawn	0.0
Little Rock	0.3	Carterville	0.0		
Little Rock	0.1	Carterville	0.0	INDIANA.	
Pea Ridge	0.0	Carrollton	0.0		
Pine Bluff	0.0	Chester	0.0	Bourbon	0.0
Temple	0.0	Chicago	6.4	Bourbon	0.1
		Chicago	9.7	Columbus	0.1
CALIFORNIA.		Chicago	7.7	Connersville	0.0
		Chicago	19.1	Evansville	0.0
Lakeport	1.0	Chicago	21.1	Indianapolis	18.7
Lincoln	0.0	Chicago	3.1	Indianapolis	19.8
Monte Vista	0.5	Decatur	0.5	Indianapolis	7.6
Petaluma	0.0	De Kalb	0.3	Laporte	1.9
Petaluma	0.0	Fairfield	0.3	Laporte	2.5
Selma	0.0	Farmersville	0.0	Marion	5.0
San Francisco	7.9	Good Hope	0.1	Sheridan	0.0
San Francisco	4.4	Kankakee	0.2	Terre Haute	0.0
San Francisco	16.4	Litchfield	87.	Warren	0.0
San Francisco	0.3	Loda	0.0		
San Francisco	8.1	Macon	0.0	IOWA.	
San José	0.5	Mahomet	0.0		
Santa Cruz	0.0	Mascoutah	0.0	Des Moines	72.
Santa Monica	0.1	Metropolis	0.0	Mason City	0.0
Stockton	0.0	Momence	0.0	Mt. Pleasant	0.6
Tulluride	0.0	Morrisonville	10.7	Muchwood	0.0
		Mt. Carmel	2.8	Rhodes	0.0
COLORADO.		Nashville	3.4		
		North Alton	0.0	KANSAS.	
Denver	0.2	Oakford	2.		
Denver	0.3	Pearl	0.0	Atchison	0.5

Cities.	Per Cent.
Beloit	0.0
Cherokee	0.0
Cherokee	0.0
Frankford	0.0
Galena	0.1
Gypsum City	100.
Hiawatha	0.0
Kerwin	95.6
Olathe	24.0
Peabody	0.0
Pleasanton	0.0
Kentucky.	
Burgin	0.0
Carrolton	0.1
Frankfort	0.0
Shelbyville	0.3
Louisiana.	
Amite City	0.0
Hammond	0.0
New Orleans	20.
St. Joseph	0.3
Massachusetts.	
East Weymouth	1.5
Great Barrington	0.0
Minnesota.	
Alberthea	6.5
Adrain	1.
Carlton	2.
Duluth	4.9
Faribault	0.9
Kenyon	80.
Lake Crystal	0.3
Mazeppa	0.3
Meridian	0.0
Minneapolis	12.
Mountain Lake	4.6
Owatonna	0.7
St. James	25.
Waseca	20.
Wells	97.6
Mississippi.	
Columbus	0.0
Ottolona	0.1
Missouri.	
Amoret	0.0
Aurora	0.2
Ava	0.1
Columbia	0.0
Cruthersville	0.0
Excelsior Springs	0.1
Garden City	0.1
Glasgow	0.0
Ironton	0.0
Jackson	25.
Jamestown	0.0
Jerico Springs	0.0
Kansas City	25.4
Kansas City	1.7
Kansas City	19.1
Kansas City	5.0
Kirkwood	1.2
Lancaster	2.2
McFall	0.0
Montrose	1.5
Perryville	0.0
Rogersville	0.0
St. Charles	0.5
St. Joseph	0.1
St. Joseph	2.5
St. Louis	4.6
St. Louis	4.5
St. Louis	2.4
St. Louis	11.8
St. Louis	37.1
St. Louis	19.3
St. Louis	2.0
St. Louis	13.
Willow Springs	0.0
Willow Springs	0.0
Montana.	
Boulder	20.
Nebraska.	
Fairbury	0.0
Omaha	0.0
Nevada.	
Winnemucca	0.9
New Jersey.	
Jersey City	0.1
New York.	
Buffalo	9.6
Jamestown	1.2
New York	1.7
New York	2.3
New York	1.2
New York	0.8
New York	4.6
Port Chester	1.8
Poughkeepsie	0.3
North Carolina.	
Henderson	0.1
North Dakota.	
Fargo	50.
Wheatland	1.0
Wimbledon	39.
Ohio.	
Cleveland	0.0
Cleveland	4.2
Cleveland	0.6
Grand Rapids	0.0
Hamilton	94.7
Oregon.	
Ashland	0.0
Huntingdon	10.
Monroe	0.0
Scio	0.1
Pennsylvania.	
Frankford	0.0
Frankford	0.1
Frankford	0.0
Philadelphia	0.5
Philadelphia	0.0
Philadelphia	25.
Philadelphia	0.0
Philadelphia	4.3
Pittsburg	0.9
Williamsport	0.0
York	5.3
Tennessee.	
Bells	0.0
Knoxville	5.0
Texas.	
Galveston	0.2
Virginia.	
Leesburg	0.3
Norfolk	0.0
Richmond	0.0
West Point	0.0
Washington.	
Everett	0.0
La Conner	0.2
Puganup	32.
Wisconsin.	
Augusta	0.0
Janesville	45.
Mayville	7.5
Medford	0.2
Neillsville	0.1
Westby	0.5

Upon motion of Mr. Main, duly seconded, the paper was received for publication.

The next paper, entitled "Shall Pharmacists Prescribe Over the Counter?" by Dr. F. E. Stewart, was read by title only by request of the author.

SHALL PHARMACISTS PRESCRIBE OVER THE COUNTER?

BY F. E. STEWART, M. D., PH. G.

In early times medicine was practiced by the priests, who ministered to both the souls and bodies of their charges, dispensing religious consolation or drugs, or both, as the exigencies of the case demanded. At that time medicine, surgery, and pharmacy were practiced by the same individual. In the year 1215 this seems to have been the case in England, although the apothecary existed separately, and dispensed his herbs and ointments to a wondering and credulous public. In the year 1215 the priests were forbidden by the church to practice any surgery which involved blood-shedding, on the principle that the church abhors blood; and about one hundred years later all surgery was forbidden them. Thus began the division of the medical profession between medicine and surgery which has lasted until the present day. But the physician still continued to prepare and dispense his own medicines, so that therapy and pharmacy were practiced by the same individual. In the meantime chemistry as a science had made strides, and as the nature of medicines from a chemical standpoint began to be appreciated, pharmacy became more and more complex. The apothecaries in those days were members of the Guild of Grocers, and the vocation did not partake of a professional character. The apothecary, however, commenced to perfect himself in the knowledge of chemistry, and pharmacy gradually separated itself from the practice of the physician and was relegated to the apothecary. In the reign of James I., the apothecaries separated from the grocers and received the first charter of their own.

When the monks ceased to practice surgery, the barbers, who had acted as their assistants, gradually stepped into their shoes, and a class of barber-surgeons, mostly ignorant in the extreme, arose, and practiced alongside of the surgeons proper. In the fourteenth century this state of affairs existed; but in the sixteenth century, medicine being still largely in the hands of the ecclesiastics, Linacre, a celebrated divine and physician to Henry VIII., founded, in England, the present College of Physicians, which, together with Oxford and Cambridge Universities, where medical schools had been established, received authority over all three branches of medical practice.

A very significant point may be noticed here, and that is, whereas physicians were qualified for their degree by study at universities, surgeons

and apothecaries obtained their qualifications by apprenticeship, so that the surgeon and apothecary were placed in the same social rank as tradesmen or members of other crafts, while physicians had the higher social standing of the learned professions. The surgeons were not allowed to prescribe medicines to be taken internally, and did not regain the right to do so until early in the present century; and, as for the apothecary, he was the humble servant of the physician, preparing the medicines which the physician ordered.

In the seventeenth century, during the reign of James I., the Society of Apothecaries was founded. Membership to this society required seven years' apprenticeship, and under its beneficent influence the apothecaries grew more and more important. Then, in 1666, the great plague broke out in England, during which the apothecaries distinguished themselves for their courage and humanity. There were many physicians who stood nobly at their posts, and many more who fled in terror. In consequence of the courage displayed by the apotheceries, and the cowardice of those physicians who proved recalcitrant, the sick fell back upon the apothecaries and summoned them from their shops to prescribe for them. From this time on there seems to have been a tendency on the part of the apothecary to more and more usurp the physician's prerogative. But it was not until 1703 that the apothecary became a prominent competitor with the physician in treating the sick. In that year a legal decision in England suddenly exalted him by giving him the right to prescribe medicine in that country, though he was given no right to charge any fee for his services, relying entirely on his medicines for profit.

In 1745 the surgeons emancipated themselves from the barber-surgeons, with whom they had amalgamated in 1540, and now formed the College of Surgeons. Since that time surgery has been steadily advancing, until it now ranks with medicine, at least in the United States. Professors of Materia Medica and Therapeutics in our medical colleges do not hesitate to say that the study of surgery by medical students has become such a fad that it is almost impossible to interest them in drug therapy. The result of this is that drugs are neglected for the knife, and the apothecary is left with but little prescription business, and has taken up many side lines to eke out a living. In the meantime our pharmacal schools are raising the standard of education, and we have the remarkable state of affairs witnessed by the existence of a body of men educated and trained to practice a vocation which is rapidly leaving them.

And what is the vocation which the apothecary is educated to fill? Ask the physician, and he will tell you that the vocation of the apothecary should be to prepare medicine as ordered by the physician, and to limit his field of work strictly thereto. There is no use whatever for the apothecary to expect harmonious relations to be established between himself and the physician if he caters to self-medication upon the part of the public.

He must choose whom he will serve. If the medical profession, he must be the servant of the doctor; if the public, he must be the servant of the public. One is his master, viz., the one he serves. And he cannot serve both, for the medical profession has set its disapproval on self-medication by the public, ignorant alike of disease and its treatment, as inimical to public health. Advertising, or recommending medicine to the public by the apothecary, can never be sanctioned by the medical profession. Moreover, the apothecary who seeks to create a demand for medicines with the public, or caters to self-medication, places himself in competition with the physician for public patronage, and thereby severs all fraternal relations with the profession. And, finally, as the apothecary has not been educated to diagnose disease, he cannot treat cases of sickness properly, and, therefore, is guilty of a moral wrong when he prescribes for the sick.

Now, any student of the subject is fully aware that the entire drug trade as carried on in the United States is in competition with the medical profession. The amount of medicines of all kinds used by physicians is but a mere drop in the bucket in proportion to the amount of medicine consumed by the public without the doctor's sanction. Self-medication is the order of the day, and the vocation of the apothecary is the supplying of the demands of the public. The wholesale drug trade and the manufacturing house exists to supply the demand of the apothecary, so that the great reason for the existence of all branches of the drug trade is to supply the demands of the public for self-medication.

It is very evident that so long as this state of affairs continues, there can be no real fraternity between the medical profession and the drug trade in any of its branches. There may be a kind of armed neutrality, or open hostility, depending upon circumstances. There is nothing new in this. From very early times until the present there has always been a warfare between the three branches of the profession, medicine, surgery, and pharmacy. But surgery, which, like pharmacy, at one time was ranked as a trade, now ranks with medicine, even if it does not outrank it. How has this come about? In this way, viz., every medical student is now educated in both medicine and surgery, and left to practice either at his discretion after he leaves college. Surgery has raised itself to the dignity of a profession by becoming a part of the medical profession, not by separating itself from the medical profession. And pharmacy can never become a profession by itself, but must find its professional position by becoming more closely associated with, and a part of the medical profession itself. I repeat it, the apothecary can never become a professional man in the meaning of that term understood by the profession of medicine, except by amalgamation with the medical profession, of which it naturally forms a branch.

I hear some one say aghast, What! do you advocate that the apothecary shall practice medicine, when you have just shown that fraternal relations

cannot exist between the physician and the apothecary if the latter usurps the prerogatives of the former? To this I reply that the demand of the public is evidently that the apothecary shall prescribe for minor complaints, and receive no fee therefor, but shall depend upon the profit derived from the sale of his medicines in return for it. This demand exists, and will be supplied by the apothecary whether the medical profession like it or not. Laws may be passed to prevent it; but it is only a question of time before they will be either evaded by the apothecary graduating in medicine, and securing a license to practice, or by their repeal.

As the demand exists, and will certainly be filled, is it not better for the public that the apothecary should be educated in medicine and taught to prescribe properly than it is to continue as at present? I believe that it would not only be for public benefit, but also a great benefit to the medical profession itself. My reasons for these statements are as follows:

In the first place all legislation in relation to the professions is founded on the theory that it is to the interest of the public to separate the practice of theology, law and medicine from the other vocations of men, and protect the same from competition with the quack and pretender. On account of the high standard of education required to practice these professions intelligently, and the beneficence and professional liberality demanded of those who make the professions their calling, the temporal and spiritual welfare of the public can only be safe in the hands of those who are specially educated and trained for those responsible vocations, and who carry on their occupation on the hlgh plane of equity which distinguishes the true professional man.

The laws applying to the practice of the professions are of two kinds, viz., those admitting members to the ranks of the professions, and those imposed by the professions on the members to guide them in their relations to each other and to the public at large. It is evident that on account of the learning required to practice the professions, the professions themselves are better able to regulate their practice than the public, so the laws adopted by the public are usually formulated by the professions.

The service which the public demands of the professions is advisory, so the laws of commercial business do not and cannot apply to their practice. The merchant and manufacturer deals in material substances, which have a market value outside of the source of supply. The public judges of the value of manufactured products by their quality. The quality of advice is dependent upon a personal factor, increasing year by year in proportion to the increase of wisdom and experience of him who gives it. While there are several vocations which partake more or less of a professional nature, theology, law and medicine are recognized the world over as the three learned professions.

Another very important characteristic separates the practice of theology, law and medicine from the other vocations of man, and that is the

beneficence and professional liberality required in their practice. Even the pauper in the almshouse has a right to demand the very best spiritual, legal and medical counsel, which are provided for him at the expense of the State. This is done by so framing the laws which protect the professions that they shall give the state their services at rates which may be considered philanthropic. The doctor visits the almshouse, and in the majority of cases receives little or nothing for his services. He spends much time attending the sick in hospitals and dispensaries, and receives no fee for so doing. The clergyman is constant in ministering to the sick and dying the consolations of religion without pay. And the state defends the poorest man who is accused of crime by supplying the best legal talent without charge. No such demands are made upon the trades for beneficent service.

Beneficence and professional liberality must characterize the relations of the professional men to each other, as well as to the public at large. What trade is required to publish the discovery of new truths for the benefit of science and of the professions? The professions are constantly contributing to the general sum of knowledge, and the position of the professional men in the estimation of his fraternity depends in great measure upon the number and value of his contributions to knowledge. It is the knowledge accumulated by the professions in the pursuit of the vocations that constitutes the material for teaching in the professional schools and colleges, and admits to the practice of the professions.

Now pharmacy, or the science and art of preparing medicine, being of necessity a part of medical science and practice, must conform to scientific and professional requirements. If pharmacy is left to the apothecary he must be educated in medical science; and, as he practices a medical art, he should be admitted to the ranks of the medical profession, and protected by medical laws. It is not practical to admit him to the profession unless he passes the same examination required of the doctor; therefore, he should be a doctor.

The apothecary as a tradesman supplying the demands of the public for medicine to be employed for self-medication is an opponent of the medical profession. His interests are not in protecting the doctor, but in serving the wishes of a self-medicating public. The apothecary is not thinking how he can best further the interests of the physician, but how he can secure the most trade from the people. Admit him to the ranks of the profession and his interests become identical with the physician, for he is a physician. Like the surgeon, now a member of the medical profession, he will oppose anything which is opposed to the profession.

The greatest opponent which the medical profession has to encounter is the so-called patent medicine business. Medical laws restraining the practice of medicine, and limiting the same to those who are educated for conducting that responsible vocation, are inimical to its interests and are

bitterly opposed. As a business it exists by deluding the sick and suffering. By its advertising patronage it controls the press to such an extent that it is impossible for the public to obtain the exact truth regarding its pretensions. It has made the apothecary its agent, and degraded him in the eyes of the medical profession in consequence. It is opposed to pharmacal schools root and branch, because they educate the apothecary in the preparation of medicine, and give him a standing in the community of influence which is used for the protection of the public from its methods of deception. While it is true that the "patent" medicine business deals in the same drugs and medicines prescribed by the physician and compounded by the apothecary, the claims made for them in advertisements are a tissue of fraud, humbug and lies. Medicines are advertised to cure consumption and other diseases for which medical science offers no cure, and the drugs advocated are the same which have already been discarded by the profession. The latest move by the "patent" medicine business and newspapers is to destroy the influence of the apothecary by claiming that he is ignorant and dishonest. The apothecary out of the way, the next move will be to destroy the influence of the medical profession.

Now, I believe that the best way to protect the public and the medical profession from the nostrum manufacturer is to educate the apothecary in medicine, and take him into fraternal relations with the medical profession. Then let his relations with the profession be defined by laws controlling his practice, just the same as applied to the physician. The medical specialist limits himself to the practice of his speciality as far as he can do so practically. The surgeon uses the knife, but there are times in which he prescribes drugs, but he does not lose professional standing on that account. In the same manner the physician-apothecary should limit his vocation as far as possible to supplying the public with medicine as ordered by the physician, but should have the privilege of prescribing in minor ailments and for emergencies. The medical profession will lose far less in this way than at present, for the educated physician-apothecary, with his influence in the community, will unite with the medical profession as a whole aginst the nostrum business, and educate the public to leave secret and advertised medicines alone. Thus the public as well as the profession will receive great benefit; and medical and pharmacal laws can be passed and enforced which will prevent the nostrum trade from continuing to deceive and defraud the public.

In making the suggestion that the pharmacist shall be educated in medicine and licensed to practice over the counter, charging nothing for his advice, and depending upon the profits of his medicine to pay for it, I am not offering anything new. Such, I understand, has been the habit in England ever since 1703. Attempts are being made in at least one of the English colonies to put an end to the privilege by passing laws against it. Such a law was recently presented to the legislative assembly of New South

Wales. I refer to the Pharmacy Bill. One provision in it read as follows: "Any registered pharmacist or person employed by a registered pharmacist as his apprentice or assistant (not being a legally qualified medical practitioner) who prescribes any medicine or practices medicine and surgery, shall for each offense be liable to a penalty of not less than five and not more than fifty pounds." This clause was struck out. and the Chemist and Druggist, in congratulating the pharmacists, says that "Chemists under the act will be limited to the practice in their own shops, in accordance with the rights and privileges enjoyed hitherto: they cannot go out with a stethescope and practice, as a good many are in the habit of doing."

Neither am I suggesting anything so wild and extreme as one of my friendly critics thought when he read the first pages of this paper: "Why," said he, "you would fill the already over-crowded medical profession with a great body of men who would be their competitors and make it harder than ever to get a living in the practice of medicine?" Not at all; my suggestion is that pharmacists should study medicine, and not be allowed to prescribe until they are educated in medicine, and become doctors. The prescribing, if recommending medicine to meet the demand of the public for self-medication is prescribing, is being carried on now. What I advocate is that the pharmrcist should be educated in medicine so that he is competent to make a diagnosis in such cases as come to him in the drug store, and recommend medicines intelligently. It is a question in my mind whether the amount of prescribing done by the druggist would not be decreased instead of being increased by so doing, on the principle that "fools rush in where angels dare not tread." At any rate, the public would be better off in the hands of properly educated men than it is now, for the pharmacists of this country, whatever may be the condition of affairs abroad, are not educated to make a diagnosis, and therefore are not qualified to prescribe.

If the pharmacist, who at least is familiar with drugs and knows what diseases they are used for, is not qualified to prescribe, because he is not educated in diagnosis, how much less is the ignorant nostrum proprietor unfitted for such a responsible vocation. And yet the nostrum manufacturer is left free to prescribe by the wholesale through the newspapers, and the medical profession seeks to restrict the privilege from the druggist. And of all the opponents that the physician has to face, the nostrum business is the most threatening. Physicians should not only encourage the pharmacist to educate himself in medicine, but do all in their power to create a body of educated pharmacists legally qualified to recommend medicines with open formulas, in place of secret nostrums foisted on the public by misleading advertisements. Such a body of men would stand as a bulwark between the public and the machinations of the nostrum manufacturers, and would do much to educate the public sentiment against secrecy

of any kind in medicine. By so doing the medical profession would conserve its own interests also, for it is surely to the interests of the medical profession to suppress every sort of quackery.

Pharmacy, or the science of preparing medicines, is only a very small part of medical science. To be a student of drugs from every point of view the pharmacist should be a physician as well. The demand now is on the part of the public for experts in the use of drugs. The medical colleges, both in this country and Great Britain, are neglecting drugs in their teaching. Mr. William Martindale, President of the British Pharmaceutical Conference, in his address as presiding officer, took occasion to call attention to the situation of affairs in this regard, and to point out that "The dual training in the same individual of the medical practitioner and the pharmacist is often desirable." He says that the study of drugs is being neglected by the schools to such an extent that it is casting discredit on the use of medicine as a factor in the healing art. And he quotes a medical writer who has said, "In five or six years hence we shall have, growing up around us men who, from sheer timidity, will rarely venture to prescribe anything but the simplest remedies," and "the unfortunate qualified practitioner, after devoting the best years of his life to the acquirement of much useless knowledge, ignorant of the means of alleviating the sufferings of his patients, will fall back on the ready-made prescriptions of the nostrum manufacturer." The Melbourne Age says that medical students are not required by the conjoint board of the Royal College of Physicians and Surgeons to devote any time to Materia Medica, and asserts that the reason assigned is that the profession has practically abandoned the dispensing of drugs and left it to a new class of experts—referring, I suppose, to the pharmacists.

On February 16th, 1897, a meeting was held in New York City by representatives of the "patent" medicine business and the newspapers to see what can be done to degrade the retail druggists in the eyes of the public, and thereby destroy their influence in recommending their own preparations, in place of their secret and much-vaunted nostrums. It was claimed by them, if we read the inspired articles aright which afterwards appeared in the newspapers, that the druggists are ignorant and dishonest, and that their preparations are inferior to the medicines manufactured at great expense by the nostrum proprietors. The latter, according to the nostrum manufacturers, are the prescriptions of the greatest physicians which the century has produced, and, therefore, standard, and worthy of all confidence. There is no better way of meeting this attempt of the newspaper publishers and "proprietary" medicine manufacturers, in my estimation, than by educating the pharmacists as doctors, and elevating their standing and influence in the community.

The immense demand for nostrums will show that the public has not discarded the use of drugs, even though the medical schools are neglecting

to teach their graduates how to use them. Here, therefore, you have a great public demand, and no class of men ready to properly supply it if the physicians discard drugs. Shall it be left to the nostrum business to prey on the public, or will the pharmacists educate themselves to prescribe drugs as well as dispense them? Surely the field is a very important and inviting one, and no body of men would be better qualified to fill it than the pharmacists, if they add to their training in the knowledge of the preparation of drugs, the knowledge of how to properly apply them to the treatment of the sick.

Finally, the prescription business is drifting out of the hands of the retail druggists, probably never to return. Not only are physicians commencing to do their own dispensing to eke out a precarious living from practice of their profession, but the amount of medicine now being employed by the profession itself has been greatly decreased, and it is likely to decrease still further if the signs of the times do not fail. The days of poly-pharmacy are over; surgery interests the profession and the student far more than drug therapy; public institutions and clubs are taking the work of the physician and surgeon out of their hands; and all these things mean that very few prescriptions are now being written in comparison to the past, while the competition in the drug business has increased. With less prescriptions and more to do the work of compounding them, it is not surprising that there has been a great falling off of prescription business.

The prospect for any improvement in prescription business is not encouraging. This is well illustrated by the following facts: The Medical News editorially calls attention to the drift of the times under the caption, "The Passing of the Physician." According to this conservative journal, "it needs no prophetic eye to see the extinction awaiting the practicing physician, using the term in contradistinction to the hospital or dispensary physician. Surgeons, aside from professors and hospital and dispensary surgeons, are already extinct. * * * What has occurred in surgery is now occurring in medicine * * * there remains only a small class of the desperately sick, whose removal might mean death. To provide for these cases it is only necessary to slightly enlarge the staff of out-door visiting physicians, and, *presto*, the thing is done! * * * Let the incredulous glance at a few figures. In the year 1893, 75,094 patients were treated in the hospitals of New York city; during the same year 680,789 patients were treated in clinics, dispensaries and out-patient hospitals. * * * In the same year there were in the city 2,842 'regular' practicians of medicine. The number of homeœpaths, eclectics, etc., * * * probably equaled the list in the Medical Register. Liberal estimate, 4,000 souls." Population of city by same authority, 1,800,000—a clientele of 450 if an equal distribution were made. "Such, however, has not been the case. The professors and the hospital and dispensary physicians get about one-half, the clinic, the hospital and the dispensary physicians the other half, and the struggling outsider gets the rest."

I do not hope that what I here say will be uncontroverted, and I frankly confess that I may be animated by personal feelings in venturing to advocate the claims of Crawford W. Long before this intelligent and representative body; for I knew him well, and in my youth learned to reverence and admire him while an employé and pupil in his pharmacy, and shall ever remain grateful for his kind friendship and valued instruction; but, as the friends of the other claimants continue to put forth and revive their claims, to which the attention of all the members of this body have doubtless been directed, it is but fair and just, while the process of moulding the final verdict is going on, that the distinguished Georgian shall have the merits of his title fully disclosed.

Each of the claimants thus far has had the recognition of organized bodies of men.

The claims of Chas. T. Jackson were recognized by scientific bodies in France and Prussia, before whom the claims of none of the others were presented.

The claims of Horace Wells have been recognized by the State of Connecticut, that State having erected a monument at Hartford inscribed, "Horace Wells, who discovered Anæsthesia Nov. 2, 1844."

A citizen of Boston, Thos. T. Lee, in honor of Jackson or Morton (it is not decided), erected a monument to the unknown Discoverer of Anæsthesia. Its main inscription is as follows: "To commemorate the discovery that inhaling of ether causes insensibility to pain, first proven to the world at the Massachusetts General Hospital in Boston, MDCCCXLVI."

The claims of Dr. Long have been recognized by the Georgia State Medical Association, by the American Association of Eclectic Physicians, and by the State of Georgia in hanging his portrait on the walls of her capitol among those of the great men of the State and country.

I shall endeavor, in as succinct a manner as possible, and in a fair manner to all, to present the facts of the controversy. As to the time and main circumstances of the first use of anæsthetics by the four claimants, the following is a fair statement:

Crawford W. Long, at Jefferson, Jackson County, Georgia, extirpated a tumor from the neck of James M. Venable, while he was under the influence of ether, without pain to the patient, on the 30th day of March, 1842.

Horace Wells subjected himself to the effect of nitrous oxide gas, and had one of his own teeth extracted without pain, to test the value of the gas as an anæsthetic, on Dec. 11, 1844.

Chas. T. Jackson did not administer ether in any operation, but it is claimed suggested its use to Dr. W. T. G. Morton, Sept. 30th, 1846.

W. T. G. Morton gave ether to a Mr. Frost, Sept. 30th, 1846, and extracted a tooth without pain.

The dates and the persons on whom ether was used in the four cases

stated, are unquestionably established. In the case of Dr. Long, the patient's affidavit, and those of four students who were in Dr. Long's office, sustain Dr. Long's written statement. And in each of the three other cases the times at which the anæsthetics were used are as amply verified and fixed.

Hence, it is beyond dispute that Dr. Long's use of ether as an anæsthetic in surgery antedates Wells' use of nitrous oxide gas two years and eight months, and the use by Morton of ether by four years and six months.

If this be true, it will be asked, why has not Dr. Long been finally and fully recognized by mankind as the true and real first discoverer of the use of ether as a preventive of pain in surgical operations? This question can be answered, in part, by suggesting that the subject has been clouded in doubt, not as to the dates of the use of ether, but because of the controversy that grew up over the rival claims of Wells and Morton and Jackson before the United States Congress, and in the persistency with which the friends of these claimants have urged and repeated their claims.

At the suggestion of Dr. Charles T. Jackson, as it is claimed by the advocates of Jackson (and this is fully substantiated), Dr. W. T. G. Morton, who was his partner in business, went before the surgeons of the Massachusetts Hospital of Surgery in the fall of 1846, four years after Dr. Long's discovery, and suggested that they test the efficacy of a new agent for preventing pain in surgery which he called "Letheon," and for which he and Dr. Jackson had applied for a patent from the United States Government. Drs. Warren, Haywood and Bigelow, surgeons in charge of the hospital, consented to try the "Letheon," which was nothing but ether disguised by aromatic oils. They, on the 16th of October, 1846, used it in removing a tumor from a young man, and afterwards, on November 7th, performed the operations of amputating above the knee and in the excision of the lower jaw—all successfully and without pain to the patients. On the 27th of October, the following affidavit was made and taken, to wit: "On this 27th day of October, 1846, personally came before me Charles T. Jackson and Wm. T. G. Morton, and made oath *that they do verily believe themselves to be the original and first inventors of the improvement* hereinbefore described (alluding to ether as an anæsthetic), and they do not know or believe the same to have ever before been known or used, and they are citizens of the U. S. A.—(Signed), R. J. Eddy, Justice of the Peace."

Jackson and Morton applied for a patent in their joint name, but Jackson, fearing the censure of the Massachusetts Medical Society on the score of ethics, insisted on assigning to Morton all his rights under the patent, and that the patent issue in Morton's name, but took a private writing that he was to get ten per cent. of all made out of it.

As soon as the surgeons of the Massachusetts General Hospital were confirmed in the belief of the success of the discovery, Dr. H. J. Bigelow, one of the hospital surgeons, wrote an account of the use of "Letheon" (to

him then an unknown or secret substance), which was published in the Medical Examiner for December, 1846.

Morton commenced to sell his patent rights, and succeeded in disposing of a number of privileges to dentists and others for various territories.

In 1847, Drs. Jackson and Morton fell into differences, and waged a war of pamphlets, involving their respective claims to the discovery, and when in 1854 Morton presented a memorial to Congress asking that the Government pay him a large sum of money for the use of ether, and in honor of him being its discoverer as an anæsthetic, the friends of Wells and Jackson, as well as those of Dr. Long, interposed their claims and defeated the movement.

The claims of Wells were by Congress, and now are generally, conceded to extend no further than to the use of nitrous oxide gas, which for the purposes of general surgery cannot be substituted for ether.

The proofs are numerous in the form of affidavits of mutual associates of Morton and Jackson that Jackson, did not in any way practically use or demonstrate the use of ether, and that Morton, who did use it, used it upon the suggestion of Jackson. The only claimant who originally conceived the use of ether in surgery, and himself experimented with its use to the extent of practically demonstrating its efficacy, was Dr. Long, and this was accomplished by him more than four years prior to the time of its use by Morton. Dr. Long did not publish in any printed form his discovery to the world until 1849, and then in the Southern Medical and Surgical Journal, but he made the discovery known to the students in his office and to practicing physicians at Athens Georgia, and in all the territory surrounding him.

He made no secret of his discovery, but talked about it on every appropriate occasion to medical men, and was waiting for the opportunity to test it in a capital operation before writing about it in the scientific journals of the day. Meanwhile those operations before described were accomplished at the Mass. General Hospital, and through Dr. Bigelow the uses of ether were published to the world.

An examination of the evidence will clearly show that Dr. Jackson never at any time practically applied ether in a surgical operation, but merely suggested its use to Dr. Morton; that Dr. Morton did, at the suggestion of Dr. Jackson, apply and use ether successfully, but that his intention was to keep the process a secret, shown by his taking a patent on it and in all his conduct; for, when at the instance of Dr. Jackson he permitted its use at the Mass. General Hospital, it was introduced and described as "Letheon," a secret compound. By reason of differences between him and Dr. Jackson, co-partners in the patent, the nature of the substance became known to the Hospital surgeons, and *they* published it to the world.

When the controversy between Morton and Jackson and Wells was raging before Congress, Dr Jackson learned that the use of ether had been

known to Dr. Crawford W. Long, in March, 1842, and in order to defeat the claims of Morton he made a lengthy journey to Athens, Georgia, to see Dr. Long, and tried to induce him to unite with him in jointly claiming the discovery. This Dr. Long refused, simply stating that he stood upon the facts. Dr. Long made no effort before Congress to obtain an appropriation, but the facts of his discovery were presented by Senator Wm. C. Dawson, of Georgia, and these facts went far to defeat the claims of Morton, Wells and Jackson to a money donation from the General Government. Dr. Long always said that the only reward he wished was to be considered a "benefactor of his race."

As between Jackson and Morton, it has been shown in an article prepared by Lord & Lord, attorneys for Dr. Jackson, and published in Littell's Living Age during the time of the controversy between them, by more than a score of affidavits from men associated with Drs. Jackson and Morton in 1846, that Morton never claimed to have had the original idea of using ether, that he invariably attributed the suggestion of its use to Dr. Jackson. He, Morton was the mere agent, an automaton in the hands of Dr. Jackson. These affidavits, made in 1846–1847, while the discussion was at its height, almost unanimously state that Dr. Morton had acknowledged this fact in the presence of the affiants, and that he clearly and repeatedly stated that what he knew about ether as an anaesthetic was derived from the suggestion and teachings of Dr. Jackson.

I quote from only one of this score of affidavits: it was made by H. J. Payne, a Surgeon-Dentist of Troy, New York, 12th April, 1848:

"On the 2d day of Jan., 1847, I went to Boston and sought an interview with Dr. Morton. I had a protracted interview with him with respect to the use and effect of the vapor of ether, its discovery, and the patent that had been taken thereupon. During this interview Dr. Morton stated emphatically and repeatedly that Dr. Chas. T. Jackson, of Boston, was the sole discoverer of this new agent for producing insensibility to pain, and that Dr. Jackson had communicated it to him. Furthermore, that all the knowledge he possessed in relation to its properties and application had come to him from Dr. Jackson, and that he never had any idea of applying sulphuric ether, or that sulphuric ether could be applied for the aforesaid purposes, until Dr. Jackson had suggested it to him, and had given him full instructions. I then questioned Dr. Morton with regard to the patent, how he came to have an interest in it, etc. He replied that he had been very fortunate in effecting an arrangement with Dr. Jackson before any one else had the opportunity, and that he was the first man to whom the discovery had been communicated by Dr. Jackson, and added, 'I have made a great bargain.'"

Now there are many such affidavits on record showing that while Dr. Morton may have used ether in 1846, he never at any time conceived such use as an original proposition, but derived all his knowledge of its properties and the suggestion of such use from Jackson.

Here then the controversy narrows down to Jackson and Long, but it must be determined as to priority in favor of Dr. Long; for when Jackson was hard pressed by Morton during the effort before Congress, he turned to Dr. Long, who had published an account of his use of ether in 1842 in the Southern Surgical and Medical Journal of 1849, and when Dr. Jackson had seen Dr. Long at Athens, Georgia, and had carefully studied the evidences of Dr. Long's use of ether in 1842, and of his having made it known to his community and to professional men with whom he was associated, he returned to his Boston home, himself convinced that Dr. Long had of his own original intuitions thought out the utility of ether, and had successfully applied it as a preventive of pain in surgical operations. And Jackson himself has admitted Dr. Long's claim to be the true and real discoverer in no less solemn manner than a written communication to a medical journal over his own signature. In the Boston Medical and Surgical Journal of April 11, 1861, Dr. Chas. T. Jackson says that he visited Dr. Long at Athens, Ga., on March 8, 1854, to examine into his claims to being the first to use sulphuric ether as an anæsthetic in surgery, and continuing says:

"From the documents shown me by Dr. Long, it appears that he used sulphuric ether as an anæsthetic:

"First.—On March 30th, 1842, when he extirpated a small glandular tumor from the neck of James M. Venable, in Jefferson, Ga. (now dead.)

"Second.—On the 3d of July, 1842, in the amputation of the toe of a negro boy belonging to Mrs. Hemphill, of Jackson County, Ga.

"Third.—On September 9th, 1843, in the extirpation of a tumor from the head of Mary Vincent, of Jackson County, Ga.

"Fourth.—On January 8th, 1845, in the amputation of the finger of a negro boy belonging to Ralph Bailey, of Jackson County, Ga.

"Copies of letters and depositions proving these operations with ether, were all shown to me by Dr. Long. He also referred me to physicians who knew of the operations at the time."

Dr. J. Marion Sims, of New York, in 1877, in an article in the Virginia Medical Monthly, quotes the above extract from the article of Dr. Chas. T. Jackson, and adds: "The above extract from Dr. Jackson's paper to the Boston Medical Journal, recognizes Long's claim to being the first to produce anæsthesia for surgical operations, but it does not tell the whole story of Dr. Jackson's visit to Dr. Long. Dr. Long has furnished me with all the evidence, consisting of affidavits, certificates, book entries, etc., that Dr. Jackson examined. He had also written to me fully on the subject, and every fact that I have stated can be sustained by documentary evidence. In one of Dr. Long's letters to me (Nov. 5th, 1876), he says: 'Dr. Chas. T. Jackson came to Georgia and spent two days with me at Athens, most of the time in my office; examining dates and certificates establishing the time, etc., of my operations, he expressed

himself as satisfied with the correctness of my claim to the first use of ether as an anæsthetic in surgical operations. Dr. Jackson informed me he would go from Athens to Dahlonega, Ga., and as I knew he must pass through Jefferson, where I resided up to 1850, and where my first operations under ether were performed, I requested him to stop in Jefferson and see some of the physicians there who witnessed or knew of the operations or were familiar with them from common report. Dr. Jackson spent one or more days in Jefferson, and on his return, expressed himself as satisfied with the testimony. In Dr. Jackson's communication to the Boston Medical and Surgical Journal, he neglected to say anything of the information he received while in Jefferson, although he admitted to me on his return that the evidence was perfectly satisfactory.'" Dr. Sims, continuing, says: "The Hon. C. W. Andrews, of Madison, Ga., informs me that he was in Dr. Long's employ and in his office when Dr. Jackson spent a whole day with Dr. Long in comparing notes and talking over the subject of etherization, and it seems that the real object of Dr. Jackson's visit to Dr. Long was to induce Dr. Long to unite with him in laying their conjoint claims before Congress as the real discoverers of anæsthesia, as opposed to those of Morton. Jackson was willing to concede to Long the honor of being the first to use ether in surgical operations, but wished Long to concede to him the honor of priority in making discovery of the principle of anæsthesia when he inhaled ether to relieve the pain and difficulty of breathing after inhaling chlorine gas (as Sir Humphrey Davy had done before).

Dr. Long says, February 8, 1877, "In our conversation I understood Dr. Jackson to yield the point of priority to me, and so did the Hon. C. W. Andrews.

"I did not admit to him that he was the first to make the discovery—leaving to me its practical application; and when he proposed to me to unite our claims—he to claim the discovery, and I to claim its first practical use in surgical operations—I positively refused. I was satisfied I was entitled to the credit of the discovery, as well as of the first practical use of ether in surgical operations."

Dr. Jackson is further quoted by Dr. Sims as having said to Dr. Long during his visit to Athens: "You have the advantage of priority in date and in the first use of ether as an anæsthetic, but we have the advantage of the priority of publication."

But Dr. Sims, continuing, says: "Now upon this point Dr. Jackson is evidently mistaken as to his advantage of priority of publication."

For abundant and indisputable evidence is given that Dr. Long did exhibit to medical men and to the community at large his operations under the influence of ether in 1842, while Wells, Morton and Jackson made no exhibit until as late as 1844 and 1846. It is true Dr. Long may not have published his discovery in the medical journals of the country, nor does it appear that the other claimants did; but exhibiting their experiments in

the large cities of New York and Boston, of course better facilities were offered for disseminating the facts throughout the medical world. However, abundant evidence has been produced by Dr. Long to prove that he made no secret of his discovery, but on the contrary communicated it as rapidly to the medical fraternity as his restricted and limited facilities would permit, and the fact that he did not perhaps publish it through the medical journals makes him none the less the true discoverer.

Whatever credit may be due to the memory of Jackson and Morton and Wells for their researches and their use of anæsthetics, and whatever honor may attach to the eminent surgeons of the Massachusetts General Hospital for publishing the facts at home and abroad, the real glory of the first discovery and proof of the efficacy of ether for the prevention of pain in surgery must be finally awarded to Crawford W. Long, the eminent Georgian and lamented physician-pharmacist.

On my last visit to my old home in Athens, Georgia, I stood at the grave of this good and great man. On the banks of the beautiful Oconee river, in our Southland, with no monument of imposing grandeur, his resting-place marked alone with the simple marbles within the power of loved ones to place there, is the grave of the great discoverer; and the flowers that bloom in sweet profusion on the earth above him seemed to betoken the lofty sentiment I have heard him so often express, that he wished no recompense or reward for the priceless boon he had conferred on humanity, save the recognition that he had "been a benefactor of mankind."

Atlanta, Ga., Aug. 7, 1897.

MR. GOOD: Mr. Chairman and Gentlemen, this paper shows a great deal of labor and a great deal of successful, painstaking research, and I am willing and desirous that it should be singled out, and move that the paper be received with a special vote of thanks of the Association to the author, Mr. Jacobs.

The motion was seconded by several and carried unanimously.

MR. CASPARI: Mr. Chairman, we have, I think, a considerable number of printed copies on hand of this very interesting and valuable paper which has just been read, and I would suggest that this Section send a copy of the paper to each of the medical journals of this country, so as to give it the widest possible circulation.

MR. HELFMAN: In rising to second this motion, I should like to mention the fact that in reporting the Jubilee Ceremonies of the Massachusetts Medical School, in whose amphitheatre Dr. Morton demonstrated the use of ether for the first time in 1846, the Boston Medical and Surgical Journal failed, as I remember, to give Dr. Long even the cold respect of a passing glance; and I would suggest, in distributing these papers, that a marked copy be sent to the Boston Medical and Surgical Journal.

MR. STEWART: I should like to offer an amendment to Mr. Caspari's motion, namely, that copies be also sent to the foreign medical journals as far as they will go. (Seconded.)

MR. WHELPLEY: Mr. Chairman, I find that there will be but very few copies of this paper left—not sufficient for the distribution that I would like to make of them myself, to

say nothing about the number the Section has voted. We have something like two hundred medical journals in the United States, besides foreign, and I move that the Association be requested to have an additional five hundred copies printed. It will be but a small expense, and all of those not required by others can be turned over to Mr. Jacobs, who, no doubt, would like to have some of these on hand to keep for distribution throughout the years to come.

Motion seconded by Mr. Eliel and prevailed.

MR. ALPERS: Mr. Chairman, I wish to make the following motion:

Resolved, That during the coming year a committee of five be appointed by the Chairman, in accordance with the recommendations of the Chairman of the Scientific Section, for the purpose of taking proper action to give pharmacy its due recognition in the National Department of Health, and that the President of the Association and the Chairman of this Section be members of this committee.

(Motion seconded.)

In explanation, allow me to make a few remarks. A bill is now in the Senate; whether it will succeed or not of course is a matter of the future, but I believe it is eminently proper for this Association to take steps that, if such a bill be discussed and such a department will be established, when the probabilities become almost certain that such a department will be established, pharmacy should be on the lookout. If we do not look out we will be put again at the tail end of the business and will be considered of no importance, and pharmacy in general will be in the same position that now the apothecaries of the army and navy are, that is, it will be considered insignificant as a menial servant to medicine; and to prevent this from taking place, this committee should be appointed. You are all familiar with the great difficulties and troubles that we have had for the last few years, and are having now, to relieve the apothecaries of the army and navy of their subordinate positions, and how difficult it is to change one existing factor in national matters. Therefore, we should be on the lookout; we should take proper precaution. There could be no possible harm in appointing this committee, and there may be a good deal of good in it.

On motion of Mr. Oldberg it was agreed to amend the motion so that the appointment of the committee be placed in the hands of the President of the Association, and also that the resolution be referred to the Association at large for action.

THE CHAIRMAN: We will now take up the report on the Revision of Pharmacy Laws. You will remember that the matter was left in abeyance because we did not have time to take up the proposition, and we should now finally dispose of it.

MR. OLDBERG: I move that the incoming Chairman of this Section be requested to appoint a sub-committee to continue the work of framing a general pharmacy law, and to present it at the next annual meeting, with Mr. Hallberg as chairman of that subcommittee; because, unless we do that, the labors that have already been gone through with by Mr. Hallberg will be lost.

Motion was seconded and prevailed.

THE CHAIRMAN: Are there any further committee reports, Mr. Secretary?

THE SECRETARY: There are no more.

THE CHAIRMAN: We skipped one paper by the Secretary which should have been taken up before, on "The Relation of the Pharmacist to the Pharmacy Law." The Secretary begs your indulgence for a few moments while he makes some remarks upon that subject.

THE SECRETARY: Mr. Chairman and Gentlemen, I simply wish to present this paper by title. It is hardly to be dignified by the name paper, for it is only a note calling attention to some frequently overlooked matters in connection with the relation of the pharmacist to the pharmacy law; and the paper insists upon it that the labeling of poisons, the keeping of properly qualified clerks, etc., are really matters in his favor which he should closely, of all men, observe; that it is to his interest to have the public understand and to have the public feel that the business of dispensing medicines and poisons is one of such particular difficulty that only those who are skilled and make use of all proper precautions may safely be entrusted with those duties. (Applause.)

THE CHAIRMAN: If there is no objection, the paper will take the usual course. (No objection.)

NOTE ON THE RELATION OF THE PHARMACIST TO THE PHARMACY LAWS.

BY J. H. BEAL, SCIO, OHIO.

In reading the papers presented at the various pharmaceutical meetings, one is impressed by the apparent prevalence among pharmacists of the idea that the intent and purpose of a pharmacy law is to protect the druggist from competition in his business. Nor is this mistake confined wholly to the rank and file of the profession. It is no uncommon thing to note in the pages of the best informed pharmaceutical journals such careless expressions as "encroachment of the legislature upon the privileges of pharmacists," "protection of the pharmacist's rights," etc. This habit of speaking is probably the outgrowth of the fact that it was largely due to the agitation of Pharmaceutical Associations that the various enactments have been secured, and also that the burden of enforcing them has universally been left to the pharmacist, so that the latter has gradually come to feel a sort of proprietorship in the laws intended for the regulation of his calling.

If this matter were merely an abstract question of propriety or impropriety, it might well be passed over in silence; but unfortunately this belief that the pharmacy law is for the private interest of the pharmacist has extended to the public mind, already prejudiced against the pharmacist as a monopolist and extortioner. Nor is this wholly false and unjust opinion confined to the general public. Within the year we have seen it advanced by governors as the reason for vetoing wise and necessary pharmacy legislation, assigned by supreme courts as the reason for holding such laws to be in conflict with constitutional limitations, while it is invariably used as a stock argument to juries in prosecutions under the law for violation of its provisions. In truth, it may be said that it is this

single idea of the monopolistic purpose of the pharmacy law, developed in various forms, which is at the bottom of all opposition to pharmacy legislation, whether it is the opposition of legislatures, courts, governors or juries. It is especially unfortunate, therefore, that druggists should by a careless way of speaking, help to extend and perpetuate an opinion incorrect in itself, and prejudicial to the efforts which are being made for the reformation of the laws relating to pharmacy.

The only foundation for the legal regulation of pharmacy is the public good. If the laws are passed for the special protection and benefit of the pharmacist, then they are class legislation and void under every constitution in the Union.

It is undoubtedly true that where there is an efficient pharmacy law efficiently enforced the properly-qualified pharmacist will not be subjected to competition by unqualified men, and his chances of winning a livelihood correspondingly increased, but he must rid himself for once and forever of the idea that the purpose of the law is to secure, even in the slighest degree, his private benefit. Any personal good he may derive from its existence is a mere incident to the good which it is intended to secure to society, and he must be content with the benefit which he receives as a member of that society.

Pharmacy is not a protected, but a restricted calling; restricted by an exercise of the state's police power, on the ground that it is a business dangerous to public welfare if improperly conducted, or if conducted by unqualified persons. Such a law cannot by any reasonable sort of construction be considered monopolistic in the American constitutional sense. If the statute limited the number of pharmacists in a given district, or if it fixed the amount of capital which must be possessed in order to be a pharmacist, then it would be a monopoly, for the reason that it would enforce an artificial restriction which might operate to prevent worthy persons from entering the calling. But as long as the law does no more than fix a reasonable standard of education for those who desire to enter pharmacy, then it is perfectly constitutional. It does not make a monopoly, because any one is at liberty to acquire the necessary education to exercise the calling.

Still another way in which many druggists help along the public sentiment that the pharmacy law is merely a scheme to protect the pharmacist is by their common disregard of the poison law, and of the provision requiring the pharmacist to keep a registered clerk. It would not be impossible to find druggists who heartily agree with the proposition that the law should prevent any but qualified persons from owning or conducting a drug store or to engage in the sale of poisons, but who are themselves extremely remiss in their observance of the very provision which justifies the limitation of the sale of drugs and medicines to a particular class of persons.

We have known of druggists who would regard it as the height of impropriety that a dealer in general merchandise should be permitted to sell Paris green, or that a department store should include a drug stock among its departments, but who within their own stores permit the poison and label law to remain a dead letter, and never hire a registered clerk as long as they can get along with a cheap boy. The evil of such a policy is probably greater than the average pharmacist would imagine. The ease with which the American people can be fooled is proverbial, but there is a limit to this foolishness, and that limit is reached when we try to make the public believe that the mere placing of the words drug store over a door will render the sale of poisons therein by an unqualified clerk any safer than if sold by an unqualified clerk in a place called a grocery. Nor will they believe that an unregistered clerk in a drug store is a safer man to put up medicines or compound prescriptions than a registered pharmacist in a department store.

This disregard by the pharmacist of the pharmacy law is wholly without excuse, and not only wrong in the abstract, but injurious to the interests of pharmacy by helping to strengthen the contemptuous opinion which the public already entertains of him and his calling.

The real and serious truth of this matter is that it is greatly to the interest of the druggist that his observance of the poison and label law and of the provision requiring the employment of properly qualified men should be so accurate and rigid as to be a constant reminder to his customers of the fact that of all known occupations that of the pharmacist is most dangerous to the public welfare if improperly exercised, or if exercised by men not fully competent and alive to the necessity of eternal vigilance.

As may be noted from the foregoing, the writer places strong emphasis upon the importance of cultivating a proper public sentiment with respect to pharmacy. The trouble has been in the past that however careful the average pharmacist may have been of his personal reputation, he has been very careless of the reputation of his craft as a whole. Pharmacist Jones has cared very little what the public might think of Pharmacist Brown, the latter has entertained a similar regard for Jones, and the public has compromised by holding them both in equal contempt.

The reformation of pharmacy is a problem which embraces many factors, and of these one of the most important is what we commonly mean to express by the name public opinion. When the pharmacist shall have attained the respect of general public opinion, and deserves it, the pharmaceutical millennium may not have arrived, perhaps, but it will have made a measurable approach, and we shall be able to obtain any reasonable modification of legislation that we may choose to ask for.

Several papers belonging to the Section on Scientific Papers were read at this point, all of which were referred to the Committee on Publication.

The Secretary read the minutes of the first, second and third sessions, and upon motion of Mr. Oldberg, duly seconded, they were approved as read.

MR. THOMPSON: Mr. Chairman, before we proceed to the installation of officers, I would like to bring a matter up. It refers to the general pharmacy law. Most all of the pharmacy laws, I believe all of them, that we have enacted in this country, now exempt all prescriptions of physicians from that part of it which requires poisons to be treated in a specific manner, as to label, registration, etc. That is to say we have a Schedule A and B, and these prescribe that all drugs enumerated here shall be sold on certain conditions named in the law except on physicians' prescriptions. Now, it occurs to me that there is a great looseness about that part of the law, that the physician's prescription should be restricted to a physician's prescription for his patient. The other point is that I think the American Pharmaceutical Association should put itself on record regarding the use of opium and cocaine. We might as well take the lead and do something in the way of stopping as far as is within our power the use of these narcotics. I therefore move that the committee just proposed for framing a general pharmacy law be instructed in their next report to formulate some law that will seek to control the use of narcotics, and restrict the physician's prescription to a prescription for the sick only.

Motion was seconded by Mr. Dohme and carried.

THE CHAIRMAN: If there is no new business we will proceed to the installation of officers. I will appoint Mr. Thompson and Mr. Oldberg to escort the newly elected Chairman to the platform.

Mr. Beal having been conducted to the platform and duly installed, addressed the Section as follows:

Gentlemen of the Section, I thank you very heartily for the honor you have conferred upon me. I have not attended these associations for the sake of honor, but for the sake of the profit that I have received. I am not sure that I commend the wisdom of your choice in this particular instance. When I look around and see those before me, and know those who will be before me next year, I recall the parable of the trees that set out to find a ruler. They asked the vine, and the vine refused to leave his wine and his fruit, and they asked the olive tree and asked the other sundry honorable members of the forest, and they one and all had sufficient honors and sufficient labors, and, as a last resort, they went to the bramble-bush, and that, feeling that almost any kind of a job would be an improvement, very promptly accepted. Now, this consciousness would be overwhelming were it not for one thing, that I realize that I am not here as your ruler, or in any sense dignified over the remainder of my colleagues on the floor, but simply as your servant, and as such servant I shall endeavor to discharge the duties of my office to the best of my ability, and with your assistance hope to succeed. As you retain your former Chairman for the new year as an Associate Chairman on another committee, I will say that if I get into any difficulties that I am not familiar with regarding parliamentery ules, I will expect to use Czar Reed's rules of order as revised by Mr. Hallberg.

The Committee conducted Mr. Webster, the newly elected Secretary, to the platform and introduced him to the Chairman, who, in turn, introduced him to the Convention.

Mr. Webster responded as follows:

Gentlemen, I thank you for this unexpected honor which has been conferred upon me. I have been somewhat interested in the subject of pharmaceutical legislation and education, and I will endeavor to do all in my power in this position to forward the cause and to bring before the pharmacists of the country anything which may be in line with progress in this direction. I thank you, gentlemen.

Mr. Helfman moved that a vote of thanks be tendered to the retiring officers of this Section.

Motion was duly seconded and prevailed.

Upon motion of Mr. Sayre, duly seconded, the Section then adjourned.

ENTERTAINMENTS AT THE FORTY-FIFTH ANNUAL MEETING.

Probably few meetings of the Association have been held where as much opportunity was offered for pleasure while traveling to the place of gathering as on this occasion, which, together with the charming surroundings of the hotel at Minnetonka Beach, made the social features of the forty-fifth meeting memorable. The eastern delegations met at Buffalo, N. Y., and spent a day most pleasantly at the Falls of Niagara in sight-seeing, under the kind guidance of Prof. Willis G. Gregory. A trip by steamboat on Lake Erie and a trolley ride from Slater's Point to Lewiston, with an hour's stop at Victoria Park and dinner at the Clifton House, afforded a grand view of the many beautiful islands and the Horseshoe Falls, as well as the river from the Canadian side. Recrossing the Niagara river on a ferry-boat, a ride on trolley cars along the brink of the famous Whirlpool Rapids and a prolonged stay at Prospect Park enabled the visitors to enjoy the beauties and grandeur of the mighty Niagara on the American side. Embarking the same evening on the magnificent steamship "North West," a most delightful trip of three days was made over lakes Erie, Huron and Superior, including a passage through the famous lock at Sault Ste. Marie and stops at Cleveland, Detroit and Mackinac Island. There is probably no more enjoyable inland water-trip in the world than the one offered on these palatial boats of the Northern Steamship Company, and nearly every one of the party who went to Lake Minnetonka via Duluth by this route, returned in the same way. A few hours rest at Duluth, the great grain and lumber mart of this country, was agreeably spent in visiting some points of interest under the leadership of Messrs. Boyce and Senger, to whom the party is much indebted for kind attentions. The western delegations met at Chicago, where they were royally entertained by the local pharmacists, many of whom afterwards joined the party on the trip to the place of meeting over the Chicago and St. Paul railroad, a special train having been provided by the company.

On Tuesday evening, August 24th, a reception and promenade concert were tendered the visiting members and their ladies by the Minnesota Pharmaceutical Association in the ball-room of the Hotel Lafayette, which offered an excellent opportunity for renewing old and forming new acquaintances. Special thanks are due Messrs. Frost, Webster, Melendy, Wulling, Huhn, Heller, Shumpik and others, who, assisted by the ladies of the Auxiliary Committee, were indefatigable in their efforts to entertain those present.

On Wednesday, August 25th, Prof. Cyrus Northrop, President of the University of Minnesota, delivered a very scholarly lecture on the subject of Modern Tendencies in Education, which was listened to with much interest by the large audience present and called forth remarks of grateful appreciation.

A trolley ride around the "Twin Cities," including a visit to the State University at Minneapolis, proved so attractive as almost to deplete the hotel of its guests on Thursday, August 26th, and to leave barely a quorum for the first two sessions of the Scientific Section. After a protracted visit to Lake Harriet and the Falls of Minnehaha, luncheon was served at the University, after which the party drove in carriages to Como Park and thence through the streets and suburbs of St. Paul, along the bluffs overlooking the Mississippi River, and passing many palatial residences on the way.

On Friday afternoon, August 27, the whole party took an extended boat ride on Lake Minnetonka, aboard the steamer City of St. Louis, for the purpose of viewing and admiring the tortuous and yet beautiful shore line of this large sheet of water. In the evening a fine concert was given at the Hotel Lafayette, and greatly enjoyed by all lovers of music. The special features of the concert were two piano solos by Mr. Arne Oldberg, the gifted son of Prof. Oscar Oldberg, a violin solo by Mr. Emil Straka, two soprano solos by Miss Mattie Redlon, of Minneapolis, and a baritone solo by Mr. G. M. Schutz. The Temple Quartet also rendered several pretty songs, and Miss E. Chenevert was the piano accompanist.

Straka's orchestra added very much to the enjoyment of the guests at the hotel by giving two excellent concerts on Sunday, August 29, one in the afternoon and one in the evening, both of which were well attended.

After the close of the business sessions an excursion to Taylor's Falls and the Dalles of the St. Croix had been arranged for Monday, August 30; but unfortunately, when the train reached Osceola, it was learned that the water supply had been shut off from the river by the Log-boom Company, and no boats could, therefore, ascend. As a substitute, a picnic was arranged on a high bluff, and a substantial lunch provided by the ladies did much toward soothing the feeling of disappointment of all present.

On Tuesday, August 31, a party of about twenty-five members and their ladies started on a trip to the Yellowstone Park, which lasted nine days, and was much enjoyed by those who participated.

The Association is under many obligations to the Local Committee of Arrangements and the pharmacists of Minnesota in general for the excellent entertainments offered and the many efforts to make the stay of the visitors pleasant, and the Ladies' Auxiliary Commmittee is entitled to special thanks for their kind attentions to the visiting ladies.

CHAS. CASPARI, JR.,
General Secretary.

REPORT

ON THE

PROGRESS OF PHARMACY.

From July 1, 1896, to June 30, 1897.

BY C. LEWIS DIEHL.

INTRODUCTORY.

"Looking backward" is a privilege that is accorded to all alike, the aged and the young. It constitutes, in fact, the sum of all knowledge, for it is upon the record of past experiences that we measure our conduct for the present or the future, be it in the exercise of the simple vocations of life, or in the development of the intricate problems of science, of mechanics, of commerce, or of government. There is a vast difference, however, in the application of this privilege by the young and by the old. The young accept the facts that have accumulated and strive to improve upon them, unhampered by experience. It is "hit or miss" with them, and in case of failure "try again." They "look backward" more or less blinded by the glamor of the future, and unhesitatingly trample upon and destroy the old land-marks, so long as their immediate object appears to be in sight. They set a pace which if uncontrolled by the mature will, and in spite of the mature often does, lead to disaster and ruin. On the other hand, the mature mind, in "looking backward," does so in the light of experience; the old land-marks are fostered and protected, and innovations are subjected to the critical test of experience before they are accepted as a finality.

These and similar reflections obtained in the mind of the reporter when, "looking backward" into the history of our Association, he compared the subjects discussed at the early meetings with those that have engaged its attention in recent years. Apparently they are the same, or of kindred nature; yet, how widely different in their application. Then,

when the question of adulteration came up, it applied mainly to the adulteration and sophistication of drugs and chemicals purveyed to the pharmacist, or to their incomplete purification, or improper selection; now, while these conditions have been greatly improved, we hear of imitation, substitution, and a want of fidelity to standards by the pharmacists themselves. Then, the secret remedies of the market were designated as "quack medicines," and their producers were handled without gloves; now, we speak of "proprietary remedies" and of "pharmaceutical specialties," and we are supposed to feel complimented when the proprietors shake our gloved hand. Then, when the subject of trade interest was discussed, it applied to methods of securing the best drugs and making the best preparations from them; now, we discuss "side-lines," the "patent medicine evil," the "cut-rate evil," and "what not" that has bearing on the pecuniary profit. Then, pharmacists and chemists freely communicated and published their experiences in their respective domains; now, the tendency to secretiveness, to withhold information that may be generally useful, or to protect such by patent, manifests itself more and more from year to year; and in the case of pharmaceutical preparations which cannot be protected by patent, it has become the common practice to insure exclusive proprietorship by registering them under coined names. If these proprietors of patented chemicals and trade-named preparations would take the trouble to "look backward" they would learn, or would be reminded that the foremost scientists of the past, whose names are as luminaries in the firmament, are those who ungrudgingly communicated the results of their experiments for all; and it may be pertinently asked, how those who now so jealously guard their own discoveries—be they important to the world at large or not—could have acquired the knowledge to make them, had their predecessors guarded their observations with like selfishness. It is not intended, however, to convey the idea that the young alone are to be held responsible for these conditions, but rather that in their eagerness to introduce the improvements so prolifically developed in modern medicine and pharmacy, they have lost sight of the established land-marks of the profession, disregarding ethical considerations and fidelity to recognized standards, or misinterpreting them. In these directions, also, the mature cannot be held blameless, and there is little doubt that much of the misery now voiced by the pharmacists throughout our land, is largely due to a misconception or disregard of these cardinal principles by both mature and young. We cannot, of course, ignore that other and uncontrollable factors are at work that have and continue to exert their influence in bringing about the conditions complained of; but it is equally true that a stricter adherence to professional ethics and to fidelity to prescription would have greatly ameliorated these conditions.

It is pleasant to dismiss these reflections; to note during the past year the usual amount of scientific and literary activity in the domains of chem-

istry, pharmacy and the kindred sciences; and that, although the word "patented" all too frequently accompanies the description of new processes and products, the quantity and quality of disinterested contributions to these sciences compares well with previous years. A number of interesting papers on subjects kindred to those which have been preambled in the foregoing have appeared in the journals and in the proceedings of different State Pharmaceutical Associations, and with other topics of interest, that are more conveniently considered here than in the body of the report, are briefly reviewed in the following:

The wisdom of the Association in creating a special committee on *Weights and Measures*, with the object of making propaganda in every State of our Union in the interest of the Metric system of measurements, and to accelerate the passage of a law by Congress making this system compulsory in the United States in all trade and transactions where weights and measures are employed, has manifested itself in many ways. The Proceedings of our State Associations have, so far as they have reached the reporter, given abundant evidence of the interest that pharmacists are taking in this desirable object in all sections of our country, and that the opposition that was formerly voiced by pharmacists here and there has now been almost completely wiped out. Doubtless the work of this committee, on which there are representatives from every State Association, has been largely facilitated by the adoption of the Metric system in the United States Pharmacopœia, which has proven a great factor in educating our pharmacists up to the system, and popularizing it. A number of writers have discussed this subject in the journals during the past year. Thus, the editor of the "Druggists' Circular" (March, 1897), speaking of education in the Metric system, observes that, as is well known, its simplicity has long commended it to men of science the world over, and that its units have displaced in the various civilized countries in which it has been adopted 391 different kinds of pounds and 292 different kinds of feet. To these countries Great Britain and the United States constitute a notable exception by not having fallen into line: a matter not of so much surprise in the case of the Briton, who may be expected to cling with a certain unreasoning desperation to the ancient, as in the case of the progressive Yankee. But both nations are beginning to realize that their lack of conformity with other nations in this regard may be of commercial disadvantage; and this argument, if once appreciated, will prove more potent with the public than all claims of science. The cry that the people must be "educated" before they undertake to use a new system, is met by the simple assertion that very little education is required. Let the merchant be provided with the necessary implements of Metric weights and measures in place of those now in use, and he can with these do his weighing and measuring just as before. After a few days by buying experience, the public would have just as clear an idea of what mass and measure is indi-

cated by a metric term, as they now have by pound and pint. Practical demonstration would do more in a year towards the establishment of metric weights and measures in this country than can be done by theorizing for a generation. Speaking of popularizing the Metric system, the "Western Druggist" (November, 1896) observes that one great difficulty with pretty much every one attempting to learn the new system is that he insists on translating it into the terms of the old, and thus to compare them mentally. This practice is as false as it is universal. The dimensions measured by the new system must be realized and associated with the respective denominations, and not related with something else. To realize this idea a most excellent suggestion has been made in a college paper, the "Franklin and Marshall Weekly:" "Let all the colleges run their various athletic sports in terms of metric measurements. Let the foot-ball fields be measured by meters instead of yards. In running races, in jumping, in throwing weights, and in all the various indoor athletic exercises, the metric units should be used in the same way." This is perhaps the best plan ever put forward for popularizing the Metric system, and one which in their amusement features pharmaceutic bodies might carry out rigidly with advantage. Referring to this suggestion, Mr. Charles T. Heller, in the December number of the same journal, calls the attention of the editor of the "Western Druggist" to the fact that the Minnesota Pharmaceutical Association had already in their amusement programs for the years 1895 and 1896 embodied and carried out the plan suggested, and did so for the reason that being a progressive association, it was deemed proper to use the Metric system in this way, and thus familiarize the system among the pharmacists and guests present.

The tenacity with which our British cousins adhere to the old-established, and particularly to their antiquated systems of measurement, as pointed out by the editor of the "Druggists' Circular," is well shown in a paper on the subject of Metric measures read by Frederick Tombs before the British Association for the Advancement of Science, at Liverpool, September, 1896, in the course of which he proposes a

Modification of the Metric System adapted to the needs of Great Britain. Mr. Tombs very thoroughly discusses the advantages and disadvantages of the metric system of measures over the old system still in use in England. He observes that "sooner or later the British public will have to accommodate itself to another system of weights and measures. A bill to legalize the decimal-metric system has been brought into the House of Commons, and will probably receive parliamentary sanction, but its adoption appears to be merely permissory. The advocates of the new system, however, are not likely to be content with this, as many are of the opinion that the use of metric measures should be made compulsory, as has already been done in many other countries. But before taking this extreme course, with all the inconveniences which such a change must necessarily entail upon im-

mense numbers of people—and more especially upon the least educated portion of the community, who are not receptive of new ideas—it may be desirable to regard, not merely the merits of the new system, but also its defects. The good points of the old system, with which everybody is familiar, should also be taken into consideration, and the endeavor made to ascertain whether it may not be possible to combine the best features of the two; so that the advantages of the Metric method may be added to the facilities of the present practice, and the new system be brought into operation with the smallest amount of disturbance to the business proceedings and domestic habits of the British nation as a whole. For simplification in scientific calculation, and for large commercial transactions, the Metric method cannot be surpassed; but the decimal arrangement does not really adapt itself to the minor transactions of retail trade and ordinary dealings of the poorer class, whose purchases require greater facility of subdivision. It is recorded that, long before the present Metric system was devised, Charles XII. of Sweden proposed the number 12 for the arithmetical base, and said: 'It is quite ridiculous to use 10 as the base for arithmetic; it can only be once divided by two, and then stops.' It would be absurd, however, to attempt now to establish a duodecimal base for arithmetic. But, having a duodecimal method of weights and measures already in operation and familiar to everybody, it would be almost as ridiculous to throw away its many advantages in order to make the habits and customs of the commonalty, as regards their purchases and sales, subordinate to the restrictions of a code of decimals. By all means adopt the base of the Metric system, in order to place yourself on a similar footing to most other civilized nations, but do not discard your old facilities of subdivision. You may on the contrary, if so disposed, increase those facilities by adding to the halves, quarters, thirds, sixths, eighths, twelfths, and so on, which are found in the present code, the fifths and tenths, which occur in the decimal code; and thus people would gradually become familiar with the Metric system in general. The want of the old subdivisions has been a source of vast trouble and inconvenience to the French people; and they have tried to palliate the inconvenience by applying old names to new divisions. But when proportions are also altered, this is merely grasping at the shadow while losing the substance. Let us retain the old proportions together with the old names, while slightly varying the basis whereon they are founded. We shall thus be brought into touch with all nations which have adopted the Metric system, and our measures will be readily convertible into theirs, while we shall still keep our existing methods, and not deprive the mass of people of the familiar knowledge which they already possess."

In the course of his arguments in this direction, Mr. Tombs observes that if unity of action could have been secured in the year 1790 between the French and British governments, it would have been comparatively

easy to reconcile the two systems of measurement, either by reducing the length of the metre by a few thousandth parts or adding to the English yard in a slight degree, and the serious arithmetical and business difficulties, extending over a hundred years, would then have been spared to the world. It is obvious now that whenever the ultimate change comes—as come it must—some alteration will have to be made in the British unit of length. The question then arises, how can this change be effected with the least amount of disturbance to existing arrangements? In the author's opinion, the key to this conversion process—which is suggested by the fact that the meter is just about one-tenth longer than the English yard—is simply to divide the metre into eleven parts, and take ten of these parts to represent the new English yard. He shows how the measure of capacity and of weight might be accommodated to this slight change (retaining grains, drachms, ounces and pounds), and expresses the belief that they might be readily accepted in place of the old measures, because the mode of applying them would be the same as hitherto. But what are we to think of a *New System of Weights and Measures* that is based absolutely upon the avoirdupois system, and conforms to the Metric system only in that the values are expressed in progressive multiples or divisions of ten. Such a system is proposed in the "Montreal Pharmaceutical Journal," by Dr. Edward P. Ford, who argues that the old system of weights and measures is by far the more convenient; but if the people of Canada are determined to have a decimal system, why should they not have one of their own, without borrwing one from a foreign country? He suggests that for measurements of weight and volume the value of the present avoirdupois ounce and imperial fluid ounce be retained; the avoirdupois ounce to be designated as "denier"; the one-tenth part of this is one "mickle"; 10 deniers are one "decanier," and so by multiples of ten there would be "centanier" (100), "millanier" (1000) and "decimal" (10.000 deniers or ounces). The fluid measures based upon the fluidounce would be the "dole" ($\frac{1}{10}$), the "tino" (1), "marvin" (10), "scovin" (100) and the "benno"—the latter being, however, 16 times the volume of the "scovin" (and a bad break in the decimal arrangement *Rep.*). The "Druggists' Circular" commenting on this suggestion, observes that "one cannot but regret such a waste of ingenuity. Dr. Ford can scarcely hope that countries in which the French decimal system is in use would change that for a new one, using a discarded unit, and that, while it is only proposed by him for his own country—one of limited area—its establishment there would result in giving the advantages of the decimal idea, but shorn of the important element of accord with other nations. And all this to preserve a unit which would not even carry its ancient name."

The Function of Pharmacy is the subject of an admirable address delivered by Prof. Albert B. Prescott before the Minnesota State Pharmaceutical Association (1896), from which the following may be brought briefly to no-

tice here. Professor Prescott says: "The nineteenth century has been a new world for the vocation of men. The pursuits of men one hundred years ago are not the pursuits of men to-day. The best professional man of that time would find himself out of a profession were he translated to the present time. The natural sciences developed in this century have created so large a proportion of the articles in use by the people, and have so changed the conditions of common life, that every vocation dealing with material things is for the most part a new vocation in a new world. Chemistry and pharmacy have both and together outgrown the times and the skill of the medical practitioner. Either he prescribes from the dispensing pharmacist, or he provides himself with ready-made forms of medicines from the manufacturing pharmacist—for the manufacturer of medicines must surely be included in the ranks of pharmacy. The primary function of the pharmacist toward the physician is to supply medicines upon prescription, a service which is in co-operation with that of the physician to the public. In the relation of pharmacy to medicine, the pharmacist is not to interpose in the treatment of disease. Yet he may apply a chemical antidote for a known poison, and should be capable of this service. The public are dependent upon the pharmacist for chemical supplies that are not medicine—supplies which physicians have never been expected to furnish. In his relation to the public the pharmacist must respect the liberty of the citizens to purchase medicines without the prescription of any physician at all, so long as the law does not require an order from a physician for the sale of poisons. But, however watchful, the liability to mistake during the exercise of his various functions is always before his conscience, and this inseparable feature of pharmaceutical service deserves compensation more substantial than the present state of the drug business affords.

"In the exercise of his functions he must judge when to deny poisons and narcotics; he may give information as to medical doses of articles of medicine, and as to incompatible administrations of one medicine with another, to prevent poisonous effects; but his own authority as an expert cannot go much beyond this, in respect to the administration of medicines. He is an expert in medicines, including a knowledge of their physical effects. The people are aware of this, and when they ask a pharmaciss what medicine to take for a stated sickness, he is often led to exceed his proper function, and to recommend some medicine as a remedy suitable for the disease which his patron undertakes to define or describe."

The New Pharmacy is not a chimera or a dream. Neither is it only a prophecy of clear-sighted men, that the new pharmacy is to take up medical chemistry in its full extent. Physicians will make a great mistake if they do not support true pharmacy, even the new pharmacy, and encourage medical analysis in the hands of the pharmacist. His laboratory, with instruments of precision and skilled attendants, not subject to interruption by visits to the sick, is to be at the service of the physician. What the

"new pharmacy" has to contend with, and what is expected of it, is illuminated by an editorial in "Merck's Report" (Aug. 15, 1896) on

Original Research.—The editor observes that the ignorant and imperfectly educated can see no use for knowledge that is not at once available in a commercial way. They fail to see that no valuable discovery ever was made until the way for it had first been cleared by a multitude of discoveries that they would deem utterly worthless. The telegraph, the telephone, the electric light, were only made possible by apparently worthless discoveries preceding them, and in like manner a series of long, tedious, non-compensating researches preceded the discovery of aniline colors and synthetic remedies. The fact is that no great practical results ever come to mankind from nature until some hero of science bridges the way to them, without money and without price. It has been tritely said that the best barometer to a nation's commercial success is the condition of its chemical trade. Accepting this to be true, every encouragement must be given to original research if we hope to compete in the world's trade. In Germany non-scientific business men and capitalists have made liberal investments in this direction, nearly every large chemical and physical industry in that country having a research laboratory where men are employed whose duty is restricted solely to original investigation. As an outcome of this, Germany stands master of the whole world in the field of scientific discoveries, and the United States, England and France have been distanced in the race, because of the want of faith and investment by capitalists in original research. In our country a few hard-working students have from time to time given us some new discoveries in organic chemistry and botany. Thanks to Mr. Ebert, our own Association has identified itself with the practical encouragement of original research; but the Association has made the fatal error, through its committees, to bestow the prize only in cases where the discoveries described are of practical or apparently practical worth, and leaving out of sight those observations that indirectly may have important bearing on pharmacy. The British Pharmaceutical Society is in so far in advance over our Association that it has established and maintains a research laboratory where original work is constantly pursued. The American Pharmaceutical Association could undertake no more meritorious work than opening a research laboratory in some part of the United States.

The Condition of Pharmacy, not alone in our country, but abroad, has been ably discussed by a number of writers. In a paper on "Progress of Pharmacy," read by Mr. Geo. Sinclair before the Edinburgh Assistant's Association (Pharm. Jour., April 17, 1897), it is not so much the text as the fact that it shows the conditions into which pharmacy is drifting in Great Britain that will interest us, for much that he says is familiar to American pharmacists in its bearings on pharmacy in this country. Mr. Sinclair says that as a natural result of the increase of wealth and the much

greater distribution of wealth, which has been such a characteristic feature of the present generation, there has been an enormous increase of what one might call "artistic taste," a love of elegance and refinement to which our forefathers were altogether unaccustomed. This has engendered an atmosphere of pampered and luxurious ease, and an aversion to do anything unpleasant or inconvenient, and it is in this that we may find the real cause and origin of the "Elegant Pharmacy cult." Nowadays a drug or medicine, to have any chance of being widely used, must be fairly palatable and easily administered. Hence the shelves of our pharmacy to-day are filled with such elegant pharmacy as palatinoids, bi-palatinoids, tabloids, tabellae, capsules, gelatin-coated pills, elixirs, liquors, jelloids, jellies, medicated wines, &c. A comparison of a prescription book of the present date with one of ten years ago, to find the increase in the use of these products, showed that the product of manufacturers had increased from 5 per cent. to 20 per cent.—an increase which, if followed up on the same ratio, will soon reduce the pharmacist to a mere automatic machine for scraping off makers' labels and writing and putting on his own. The dispensing department of pharmacies being thus undermined by these elegant products, which are kept continually before the doctor by means of liberal supplies of samples, it behooves pharmacists to make up their minds as to how they are going to stand in regard to this tendency. Mr. Sinclair very strongly expresses the belief that, within well defined limits, the retail dispensing pharmacist can, if he chooses, turn out from his dispensing counter products which will compare favorably in point of accuracy of dosage, elegance and activity, with the products of any large manufacturer. He goes into particulars respecting some of these to illustrate his views, and concludes with the dictum that to be successful in this effort three things are essential, viz.: elegance, accuracy and resource. "If we keep these three always before us, and put them into practice, we shall worthily uphold the dignity of our craft, and perchance help it forward one step in the onward path of progress, and so hasten the coming of that better day which is said to be dawning somewhere for the pharmacist."

The condition of German pharmacy in its professional and commercial relations is the subject of an editorial in "Pharm. Review" (December, 1896), by Frederick Hoffmann, from which it appears that in Germany also the conditions that confront the pharmacist grow more perplexing from year to year. The nimbus which at one time surrounded the "deutsche Apotheke" has become visionary, although the myth about German pharmacy flourishing in comfortable security and opulent prosperity under State control has remained. In reality, the prestige which German pharmacy still retains in foreign countries no longer lies in the German apothecary shop, but it is due to its scientific representatives, who generally work and produce outside of the pharmacy. The opulence of the pharmacies, the number of which was formerly limited to be in a certain

ratio with the population, has been greatly reduced by the trade in simple drugs and articles used for medical and technical purposes being made free, for since then there have grown up besides the pharmacies numerous drug stores, and their number in course of years has grown so that at the present time there are on an average about three retail drug stores for every pharmacy. The editor quotes at some length from a paper recently published by Dr. Springfeld, a physician in the service of the Prussian government, from which the following clearly illustrates the present condition of German pharmacy: "Since the separation of chemistry from pharmacy the centralization of the production of medicinal preparations in the hands of the pharmaceutic-chemical manufactories, the labors of the pharmacist have been transferred from industrial to mercantile. The professional apothecary of the past has been succeeded by the trader. Even the prescription work has been restricted and has deteriorated in scientific value, since the wholesale industry succeeded in preparing medicaments all ready to be dispensed and capable of preservation for almost any length of time. The dispensing apothecary has thus been largely converted into an automaton, and the German pharmacy has become incapacitated for the training of apprentices."

Among the expedients and reforms proposed in order to ameliorate these conditions in some degree, the hope is still entertained that the science of forensic and food chemistry may bring back life into the quiet laboratory of the apothecary, be an incentive to love of profession, and raise the estimation of the apothecary in the eyes of the public. But, observes the editor of the "Pharm. Review," in a foot-note, "this alternative, devised and striven for until now by the best men in the profession here and abroad, cannot be hoped to be realized for the apothecary, considering the activity in medical circles and the rapidly advancing development in bacteriology, which is so closely affiliated and enters so deeply into the biological and physiological sciences. The substance and all relations of bacteriology to the healing art and hygiene are so overwhelmingly within the province of medical study and effort, that the apothecary can or will hardly be called upon to participate in it in the near future."

In France, also, the condition of pharmacy is not as rosy as one might suppose. Dr. R. G. Eccles (Drugg. Circ., Oct., 1896) gives an account of his observations on pharmacy in France during a recent visit, and says that, inasmuch as France has placed no restriction on the number of pharmacies that can be started in any region, each owner endeavors to outdo his neighbor in the splendor of his display. To the few who occupy favored sites on the principal streets in Paris, Lyons, and the larger cities, pharmacy is a lucrative profession. Their incomes are quite large, and their outlay relatively small. The suburban pharmacists, on the other hand, are harassed by competition of the corner grocer, who sells simple drugs and proprietary goods that by right should fall to the pharmacist.

But while the law does not directly restrict the number of pharmacists, it does indirectly limit them through its rigid requirements for graduation. No one is permitted to open a pharmacy until he has received his degree from the Ecole de Pharmacie, and this he cannot get until he has served an apprenticeship of two or three years and attended lectures six years. The respect shown pharmacists by the French people is much greater than that bestowed upon American pharmacists by Americans. Patent medicines are held in their proper places, since no proprietary remedy can be offered for sale until its exact composition has been made known, both in formula and in process of manufacture.

Among the many factors that have been engaged in bringing about the present unsatisfactory conditions of pharmacy, so far as our own country is concerned, there is perhaps none so strong as the

Lack of Fidelity to Prescriptions.—This has often been discussed by thinking men in the profession, and so also during the past year has been the subject of frequent comment. The right or wrong of the practice of making tinctures from fluid extracts, considered in this connection, is one upon which pharmacists are not agreed, and the discussions that have been brought about through the efforts of Mr. Lyman F. Kebler are therefore particularly opportune. Having previously submitted some queries on this subject to Dr. Edward R. Squibb, Dr. Charles Rice and Prof. John Uri Lloyd, he presented the replies received at a pharmaceutical meeting of the Philadelphia College of Pharmacy, at which the subject was thoroughly discussed in all its bearings.

Dr. Squibb confines himself to a single argument against the practice, which has been sufficient to control his practice ever since fluid extracts were introduced. This objection is that it is not authorized by the United States Pharmacopœia, and that therefore such tinctures are not official, but are substituted for the official tincture. To make them so is to break through our own authority, or law, as to how they should be made. and to substitute them for the United States Pharmacopœia tinctures is an immoral act, of dangerous influence and example. If a dispenser makes a tincture from a fluid extract, according to the formula of the fluid extract maker, he goes behind his only legitimate authority, the United States Pharmacopœia, both for material and process. If he says: "I buy standardized fluid extracts because they are better than unassayed drugs," he brings the practice to depend on the standardization, which is still further back from the legitimate responsibility, for then, who standardizes the standardizer, and who authorizes his assay process? When the Pharmacopœia finds a set of assay processes simple enough to be trusted for general use, it will probably direct some such practice. It has not done so as yet, and until it does it is but right, and it is part of wisdom and safety, to conform to its authority and obey its commands.

Dr. Charles Rice in his very elaborate and instructive reply to Mr.

Kebler's interrogation formulates the following propositions: 1. If a fluid extract differs from a tincture only in the quantity of the solvent or menstruum, and if the dilution of the former to the strength of the tincture by addition of more of the solvent throws nothing out of solution, the two tinctures must be alike in the quantity of active constituent, and, therefore, be alike in therapeutic effect; it being understood that in comparing any fluid extract and tincture made from one and the same drug, they are assumed to have been prepared from known quantities of the drug of known strength, and, therefore, to be commensurate. 2. If the dilution of a fluid extract to the strength of the corresponding tincture by the addition of even the most favorable menstruum causes a precipitation, the two tinctures may still be regarded as alike in therapeutic effect, if the precipitate contains none of the useful medicinal constituents. 3. The practice of preparing tinctures from fluid extracts, in all cases where dilution causes obvious physical changes, such as precipitation, gelatinization, etc., is not to be recommended for general use, but may be adopted in case of necessity or urgency, when a prescription calls for the tincture of a drug of which only the fluid extract is available or obtainable.

Prof. John Uri Lloyd gives the opinion that in cases in which the therapeutic constituent or constituents of the drug are firmly established and known, and in which no question exists concerning the exact value of the fluid extract, there seems to him no question but that the tincture may be made by diluting the fluid extract; this, of course, being in cases where the menstruum will not be considered at all as a therapeutical part of the product. The method of preparing tinctures from an unexceptional (standardized) fluid extract is to be preferred to blind extraction from a standardized drug. It is to be preferred also in the case of such drugs as deteriorate rapidly in substance and keep well in their extracted form—such as pennyroyal and peppermint, pulsatilla and arum, etc. In case of the great class of drugs in which nothing has been recorded as to the therapeutical constituents, and in which the menstruum employed in making the official tincture is different from that used in making the fluid extract, Prof. Lloyd hardly ventures to express a view, for or against, preferring to place these among "emergency" preparations, which may be made from fluid extracts in cases demanding prompt action, but in which the general stock of tinctures should be made, as yet, from the drug. While, however, he can see no reason why in certain cases tinctures may not be even by preference, made from fluid extracts, he does not advocate such substitution without pharmacopœial authority.

Mr. Joseph W. England opposes the manufacture of other galenicals from fluid extracts on the ground which he had explained at length in a paper read in 1893 (Amer. Jour. Phar., Sept., 1893). He emphasized one of the statements then made that different classes of proximate principles were yielded to menstrua of varying strength, and, inasmuch as the

menstrua for these two classes of preparations varied greatly, the official tinctures could not be made from the respective fluid extracts. He, furthermore, claimed that the official tinctures were relatively stronger than the corresponding fluid extracts; and that their preparation from manufactured fluid extracts was impossible, since they vary from the pharmacopœial standard both in process and in the menstrua used for their preparation.

Prof. Joseph P. Remington's arguments were also against the practice of making tinctures from fluid extracts. The latter are more strongly alcoholic than the tinctures. Principles that could not be obtained with a small amount of dilute solvent could be extracted from the drug by a large quantity. If the practice is to obtain only in the case of standardized fluid extracts, it will be limited, since many manufacturers give directions for diluting fluid extracts which they do not standardize. Another element of inaccuracy is the practice of manufacturers of storing fluid extracts for a time and then removing the precipitate formed.

Mr. Kebler in his reply to these and other arguments (subsequently communicated to the "American Druggist," Feb. 10, 1897), observes that the consensus of opinion of many physicians whom he had an opportunity to consult on this important question is that tinctures made from reliable standardized fluid extracts are much more uniform and more desirable preparations than those made from drugs concerning whose strength we know practically nothing. While Mr. Kebler does not commit himself to a decided expression of opinion on this subject, it is very evident from his review of the arguments, *pro* and *con*, presented by others, that he inclines to favor the practice so long as standardized fluid extracts are employed. Cinchona, nux vomica and opium, and their preparations, are the only ones for which the present Pharmacopœia gives process of assay, but in the next revision this number will doubtless be increased. How non-standardized preparations may vary in strength can be shown in numerous examples—in aconite, coca, ipecacuanha, belladonna, stramonium leaves, physostigma, ignatia, &c. In the case of aconite root he has analytical records showing that one bale assayed 0.4 per cent. of total alkaloid and another 1.14 per cent. A tincture made from the latter would be more powerful than the fluid extract made from the former. Again, one sample of coca leaf contained 1.02 per cent. of total alkaloids, another assayed 0.32 per cent., and lower data are on record. Now one is more than three times as strong as the other, and the tincture and fluid extracts made from them would hold the same ratio to each other, providing they are made according to Pharmacopœia. As showing some inconsistencies of the Pharmacopœia, Mr. Kebler observes that it directs the tincture of nux vomica to be made from an assayed powdered extract which is radically different from the solvent employed for the tinctures, but that it is held to be wrong to make a United States Pharmacopœia fluid extract and dilute it—precipitation being entirely obviated in the latter case.

In general, Mr. Kebler has not seen any valid reason advanced against diluting fluid extracts with the proper menstruum to make a tincture, except that it is not United States Pharmacopœia. As to infusions there is no question but that the practice of making them from fluid extracts is wrong in most cases, though it remains to be demonstrated that some infusions made from the fluid extracts are less active than infusions made from the corresponding drug. In continuation Mr. Kebler observes that he has endeavored to present these facts as they were brought before him daily. There are doubtless two sides to this question, but for their final adjustment there is a vast field of work before us in which the various sciences must co-operate. Meanwhile let us abide by the Pharmacopœia as closely as we possibly can.

Evidently referring to this controversy, Mr. Wm. B. Thompson (Amer. Jour. Pharm., March, 1897) observes that the use and *mis*-use of fluid extracts in extemporizing the preparation of the lesser galenicals has evoked the expression of some opinions and is likely to arouse more. It would seem to be within the confines of truth to say that at least 90 per cent. of the pharmacists of this country resort, to a greater or less extent, to the practice of diluting fluid extracts to form minor preparations, and it now has the appearance of an eleventh-hour conversion for pharmacists to criticise the natural sequence of their own acts. No protest having come from the medical profession in regard to any deficient therapeutic value of the lesser galenicals so made, may we not be straining the point or principle somewhat in making too broad a condemnation of the practice? If the fluid extract is right exactly, and in every particular just what it should be, the addition or dilution, provided it be made without material disturbance of permanent solubility, *must be right.* Had we not better wisely adapt the fluids to the dilutions?

The editor of the "Western Druggist" (Jan., 1897), speaking on the same subject, says that the practice of preparing official tinctures by simple dilution is a growing one, but cannot be condemned too severely. If the fluid extracts could be so prepared as to contain identically the same proximate principles and in exactly alike relative proportions as the tinctures made from the same drug, there could be no valid objection to the practice, but this avowedly is not the case. And even were it possible to extract the drug completely by means of a mentruum identical with that of the corresponding tincture, the fluid extract would materially differ in properties because of the change brought about by virtue of the greater degree of concentration of the liquid. This has been fully demonstrated by the classical researches of J. U. Lloyd, which have shown that even the every-day changes in temperature deleteriously affect the composition of fluid extracts. In a similar vein the editor of "Merck's Report" (March 15, 1897) discusses the question of

Substitution. He says that at present there is a strong undercurrent at

work that would, if unchecked, soon wholly undermine the authority of the Pharmacopœia. It is the tendency to break away from its restrictions and every man to become a rule unto himself. Manufacturers do not follow it with the fidelity they should. Preparations made at home by the retail pharmacists are frequently very far away from its specification. Fluid extracts prepared with menstrua wholly unlike those called for by the Pharmacopœia are found everywhere. Tinctures are made from the fluid extracts instead of the drug. The manufacturer may claim superiority of their product by virtue of new and original processes, and no one may hinder him from making such goods; but who is to decide how much he may deviate and still supply a product that conforms with the pharmacopœial requirement? In the case of chemicals greater purity than the definition of the Pharmacopœia cannot be held to be an objection, but alleged improvements in galenical products have a very different bearing. It has hitherto been generally assumed that when a doctor ordered any article by a pharmacopœial title he meant the article of the latest-revised Pharmacopœia. A deviation from this without the specification by the doctor leads to confirming the charge latterly so often made, that pharmacists are in the habit of practicing substitution.

In this connection an article on "Uniformity in Pharmacy," read by Mr. C. F. Henry, before the Edinburgh Chemist Association (December, 1896), deserves mention. Mr. Henry observes that "Uniformity is one of the most important objects to be attained in pharmacy"—that a preparation known by a certain name should be obtainable of the same composition and strength everywhere. When chemicals, drugs, or preparations are supplied of the same composition, strength and appearance by all pharmacists, not only is public confidence gained and retained, but what is more important, medical results are more uniform, doses more readily ascertained, and diseases more readily overcome." "In cases where a different article, differing either in appearance, composition or strength is supplied to the public under the same name, not only in two separate towns, or it may be in neighboring shops, public confidence is shaken, annoyance caused, and one or other, it may be both pharmacists, blamed and mistrusted." "One of the objects of instituting pharmacopœias was to amend such a state of matters. That they have largely attained their object there can be no doubt, yet it is sometimes urged that by a different process or by different apparatus than is required by the B. P., the whole of the active principle can be obtained from a certain root, or at least more of it than can be got by the B. P. process. Again, commercial gentlemen, chiefly those representing American manufactures, urge the claims of their particular preparations, because they are stronger than the B. P." Some cases are, however, pointed out and discussed by the author, in regard to which doubt exists as to what should be supplied when they are prescribed or asked for. About this he makes the follow-

ing concluding observations: "In very few does the medicinal effect differ to any great extent. Medicinal practitioners might do much to remove the uncertainty which occurs by being more explicit in prescribing: while synonyms in the B. P., might be extended with advantage, so as to assist both prescriber and dispenser in cases of doubt. Finally, it would be a benefit to their fellows and to uniformity if dispensers would make it the rule to note on prescriptions what has been supplied for those medicines in regard to which two or more preparations might be given."

But to resume the subject of "substitution" in its bearing upon American Pharmacy. Given a fluid extract of proper quality, and dispensing a tincture prepared from it with proper diluent, will probably be considered a mild form of substitution. But there are other forms of substitution laid to the door of pharmacists, which are not so innocent in character, and which have been frequently voiced in the Association and in the medical and pharmaceutical journals. The "Pharm. Era" (September 10, 1896), calls attention to several editorials that have recently appeared in several medical journals, in which it is charged that the practice of substituting one preparation for another by pharmacists is more prevalent than would at first sight appear, and, that to such as take pains to examine, the damaging testimony against the unprincipled pharmacist is overwhelmingly evident. Aside from the question of fair dealing between man and man, of ordinary justice in trade, and common honor in protecting the consumer, this outrageous practice of substitution not only tends to distrust of the one in whom every confidence should be placed, but it is a direct menace to the skill of the physician and the faith he may have in well-tried drugs. Further than this, the very life of the patient may hang upon the culpable waste of time that a substitution may entail. Under such conditions we must in the end narrow ourselves to the advice to patronize such only as are known to be honest. Another writer on the same subject says, "The profession of pharmacy cannot alone crush out the practice, but its influence ought to be exerted to the utmost to that end, and doubtless will." "But we cannot expect influential members of the profession of pharmacy to suppress this evil single-handed; we of the medical profession have our duty to perform in the matter, and more powerful weapons with which to carry on the conflict. But it is one that will call for all the resources of both professions, and both ought to be glad of the active co-operation of the manufacuring pharmacist."

Under the stigma of such charges, it behooves us to inquire into what constitutes a substitution. The editor of the "Amer. Jour. Pharm." (April, 1897), referring to the outcry against substitution by pharmacists of one manufacturer's preparation for the other, draws the following line of distinction in substitution. Certainly every physician has a right to specify any particular manufacturer's preparation, and the patient has a right to receive it. If the pharmacist to whom the prescription is presented for

compounding does not care to furnish the product of the specified manufacturer, he has a right to decline and to return the prescription. He has no right, however, to substitute his own or anybody else's preparation for the one specified, even if he is sure the substitute is as good, or, as he may think, better. On the other hand, substitution is almost impossible in the sale of patent medicines. When a customer asks for one of these—proclaimed by the advertisement to be "the standard remedy"—the pharmacist will not go far astray if he undertakes a little missionary work, and either sends the patient to a physician or supplies him—after due recommendation—with a standard preparation of his own manufacture, which perhaps has not been so extensively advertised, but which has real merit.

What constitutes a proprietary article is very clearly defined in a report by Dr. Charles Rice to the Medical Board of Bellevue Hospital. He defines a proprietary article as one of which some person or persons have exclusive control of the production, sale or use. He divided such articles into natural and artificial products and again into three classes:

1. Products of nature prepared under patents and mostly sold under copyrighted names, products of nature embracing all chemical substances of definite and constant composition. Such a product cannot be patented, even though it may, at the time when the patent is applied for, not yet have been found occurring ready formed in nature; but the process of preparation, if not previously known, is patentable. Products of this class are antipyrine, aristol, phenacetin, salol, salophen, sulphonal, trional, vanillin, etc.

2. Products of nature that have never been made under patents or are no longer so made, but are sold under copyrighted names. Such are antifebrin (acetanilid), dermatol (bismuth subgallate), formalin or formol (formaldehyde), pyrozone (hydrogen-dioxide solution), diuretin (sodium-theobromine salicylate), and lanolin (hydrous woolfat).

3. Artificial preparations sold under copyrighted names. These are divisible into three groups. The first group, which, as also the before mentioned two classes, he considers unobjectionable from the ethical standpoint, comprises preparations the origin and composition of which are not kept secret, such as ichthyol, creolin, Mellin's food, malted milk, etc.

The second group, which he thinks is of doubtful value, includes all the preparations of the class that do not belong to either the first or the third group, while

The third group, by far the largest, consists of the "secret nostrums," such as "Soothing syrup," "Female regulators," "Blood purifiers," etc.

The importance of drawing a distinction between "patented" medicines and "secret" nostrums is very evident when considered in the light of modern medicine and pharmacy. The editor of "Pharm. Review" (April, 1897), observes that it is unfortunate that in the development of secret remedies in this country, these have been designated as "patent

medicines." This has given rise to the denunciation of medicinal substances that are rational in composition but protected by patent. A general storm of indignation has been raised against foreigners who have availed themselves of our patent and trade-mark laws in preventing all competition, whereas the energies should be directed against our barbarous laws that sanction highway robbery. The result of this irrational feeling is that individuals of probity and integrity are maligned and their motives are questioned; that manufacturers and individuals, instead of enriching science by valuable information in their possession, keep it secret.

Prof. John Uri Lloyd, in a communication to the Pharm. Review, May, 1897, speaking at length upon the same subject, says there are two classes of apothecaries—those that prefer to purchase their supplies of medicine and devote themselves to distributing them, and those that believe in experimentation, scientific study, laboratory work and pharmaceutical manipulations. The latter have not been encouraged as they should have been, and he believes that they have been and continue to be handicapped by ethical considerations; for a distinction should be drawn between this class of apothecaries and the class of men who occupy salaried or professional positions. Until, therefore, a corresponding return is made to the public by other inventors, until others give their brain work to competitors both at home and in Europe, he is not in favor of making American pharmacists do so. Those in trade who make discoveries, by the application of science and skill that benefit mankind, should in his opinion either receive a personal return in the way of royalties from some responsible manufacturer, or should profit directly from their discoveries. Speaking for himself, he observes that he is well aware that in his views in this direction he has never been on the popular side, and that some of his closest friends feel now, and always have felt, that he is a heretic in trade ethics. But, while he agrees that charity is a duty, and that it is more blessed to give than to receive, he has felt it a duty to provide for his family, to acquire as much of an education as possible, to try to guard against poverty in his declining years, and to leave a substantial testimonial of regard to his fellow pharmacists who wish to study and work in real pharmacy; none of which he could have done had he permitted himself to be misled or to be drawn away from what he firmly believes is right. The right of personal returns to individual investigations is a birthright, and he who uses the legal methods for self-protection in discoveries is doing no more than justice towards himself and family, regardless of sentimental codes of ethics that strike at the use of the privilege instead of their abuse. He believes that we have in our ranks a regiment of worthy men facing lost opportunities, lost because of the fact that pharmacy ethics of the past offered no inducement for the financial self-protection of meritorious workers.

That physicians are awakening to the serious aspect of the question of

Patent and Trade-Marked Medicines is evidenced in a paper recently read by Dr. E. F. Stewart before the Wayne County (Mich.) Medical Society, entitled "A Menace to Medical Science," and commented on editorially in "Merck's Report" (Dec. 15, 1896). Dr. Stewart contends that both medicine and pharmacy are endangered by the patent medicine men, that the trade-mark system as applied to patents destroys the object of our patent laws, that ordinary commercial methods in pharmacy are undermining the same, that both medicines and pharmacy should be set apart as liberal professions and no one permitted to enter them without a high degree of education. He asks the medical profession to change its attitude towards pharmacy by aiding, not hindering, pharmacists in their efforts to obtain just legislation, and calls upon the two to combine and purge themselves from the secret-nostrum evil. Physicians should refuse to prescribe anything not containing a complete working formula that can be followed by any one skilled in the arts.

Mr. John H. Bot, in a paper read before the Nebraska Pharmaceutical Asociation (1896), also makes some vigorous remarks on patent and proprietary remedies. Speaking of the patent medicines, he says the trade in them, though formerly a source of profit, is no longer profitable. Let us place the money we would invest in this class of goods—double, triple the amount, if necessary—in a plant of our own, and proceed to manufacture them. Speaking of proprietary remedies, by which he evidently alludes to the numerous trade-named specialties of the market, Mr. Bot says that the proprietary people are trying hard to fill the gap (originated by them) that is constantly growing wider between pharmacy and medicine, and have succeeded to a great extent, as becomes evident if we examine our prescription files. The remedy for this evil rests entirely with us. We must try to stand on closer footing with the physicians, for we are more to blame than they; it is negligence on our part, for letting these concerns get away with our friends. We should approach them daily in a friendly and courteous manner, suggest formulas, for we have them compiled in the National Formulary, and it is our duty to show them what it contains. They will gladly listen to us as they do to others, and more so because we stand closer to them than anybody on earth. This idea that

Pharmacists Should Make their own Preparations is frequently expressed by writers during the past year; by some as one of the measures for combating the inroads of manufacturers, by others because it is the proper thing for the pharmacist to make the preparations he dispenses both from the economical and the professional point of view. The editor of "Merck's Report" (June 1, 1897), with the aim to encourage pharmacists to make their own preparations, makes some trite observations that may be profitably heeded by those whose custom is the reverse. He says the habit of buying galenicals for the preparation of which the Pharmacopœia gives formulas and directions is a bad one on a number of grounds. There is

not one of them that the pharmacist cannot easily make if he only tries to do it. In every one he will save from twenty to fifty per cent. on the first cost. By doing such work he becomes a better and more reliable pharmacist, as well as a richer and a wiser one. It can all be done in time that would otherwise be lost. There are often minutes, and, in some cases, even hours, of unbroken idleness, so far as the store is concerned. There are days when even the most prosperous stores do very little business and when clerks and proprietors, if inclined that way, sit idling and wait for customers that do not come. All such time should be utilized in making preparations that otherwise have to be bought, or it may be employed in pharmaceutical research or in study. When a man makes his own goods he can honestly vouch for their quality, when he buys them he can not always do so.

The editor of the "Western Druggist" (July, 1896), speaking on the same subject, says that while fully recognizing the importance of the commercial side of pharmacy, this is not necessarily neglected in order to give the laboratory its proper attention. The great majority of the pharmacists of this country are by no means so busy that they should be obliged to neglect the legitimate portion of the drug business in order to attend the trade they have. The tendency seems to be away from the laboratory, to depend more and more largely on others for supplies which pharmacists should make for themselves. Certainly, if it is profitable for manufacturing houses to establish plants, to engage travelers to solicit trade in order to sell their goods, it must be profitable for the pharmacist to make them for himself, the more particularly since nothing adds to the reputation of the pharmacist so much as his ability to do this class of work well.

Mr. H. H. Hokey, iu a paper read before the Indian Territory Pharmceutical Association (1896), mentions numerous "reasons why we should dispense our own preparations." If we dispense our own preparations we know what we are giving to our customers. If we make tinctures from fluid extracts we do not know what we are giving. By making our own preparations and calling the doctor's attention to them we would soon clear our shelves of a large variety of unprofitable goods, provided we exercise the care we should in their preparation.

Among the measures also proposed to combat the inroads made by manufacturers upon the legitimate field of retail pharmacy, that contemplating the establishment of

Co-operative manufactories has been discussed in many of the State Associations. In several States such manufactories have actually been called into life by stock companies composed of retail pharmacists, who during the past year have sought the endorsement of their respective State Associations. The "American Druggist" (July 10, 1896), in speaking of a stock company proposed by the Erie County Pharmacentical Society, says it is its aim to make retail pharmacists independent of the manufacturers

and jobbers, and to place them in a position to meet the competition of department stores and cutters' prices on regular goods. The New York State Pharmaceutical Association having endorsed the formation of a joint stock company of this character, the retail pharmacists of the two States (Minnesota and Illinois) who were among the first to undertake the manufacture of rebate goods for distribution through channels selected and controlled exclusively by themselves, should feel greatly encouraged.

The editor of the "Pharm. Era" (August 6, 1896), discussing the same topic, says that the scheme of co-operative manufacturing is an alluring one. "It appears to offer a way out of the cut-rate patent-medicine woods, and a tempting financial profit. The druggist considers himself, as he surely is, abundantly qualified to prepare domestic and popular remedies, and he sees no reason why he shouldn't get this trade for himself rather than for the proprietors." But in his newly awakened zeal and enthusiasm, he is in danger of going to extremes, of overlooking the distinction between *meum* and *tuum*. "Some druggists" boldly assert that their object is to produce preparations just as nearly as possible like the advertised proprietaries in composition, style of bottles and label (while keeping within the law, and avoiding infringment of trade-mark and copyright privileges), and trying to sell these imitations whenever and wherever the patent medicine is asked for. This seems a pretty poor kind of business for honorable men to engage in." "We are in favor of the druggist making his own preparations, of his supplying the existing demand for domestic remedies, but he should make them just as good as he can, and not be simply an imitator."

The "Druggist's Circular" (Oct., 1896), also makes some observations on this subject. Conceding the right beyond question of any number of dealers, either individually or collectively, to manufacture their own goods, there are two good reasons why pharmaceutical preparations—whether they be official or of the "household variety"—cannot be made by co-operative organizations of retail druggists. In the first place, mindful of the fact which similar experiments have demonstrated, no business venture can be profitably managed by a committee, the more especially where the only interest the members have in common is a means towards the competition in which they are otherwise engaged; and secondly, even if these obstacles were successfully overcome, the scale on which these organizations are formed is altogether inadequate to the necessities of an enterprise which is to compete profitably with the established manufacturing concerns. Looked at from the purely commercial standpoint, the editor believes that the opportunity for the retail druggist exists as a distributor of the products of others rather than as a manufacturer. If the energetic apothecaries of the country would, by the exercise of their professional training, coupled with a little more mercantile persistence, keep in touch with physicians, and cater to their notions rather than seek to repel both

their trade and their patronage, there would be small chance for the physicians' supply houses or the manufacturers who live by direct purchase of the doctors.

That co-operative manufacture should be seriously considered in Germany will probably be news to most American pharmacists. The "Pharm. Review" (Feb. 1897) says that in Germany the pharmacists have been so stirred up by the inroads made by the manufacturers upon their profession, that co-operative measures are being seriously discussed, and it has been suggested that each section of the German Apothecaries' Society conduct its own manufacturing plant. The idea has probably been taken from this country, and was apparently engendered by the unsympathetic statement attributed to a prominent German pharmaceutical manufacturer that "the tendencies of the times will not be checked by the practicing pharmacist or by the manufacturer," and "that the manufacturer does not seek his salvation in fruitless complaints, but in helping himself."

Among the modern products of manufacture perhaps none have been more obstinately opposed by pharmacists and more readily accepted by physicians than

Tablet Triturates. The constantly-increasing tendency to prescribe the active principles of drugs in place of their galenical preparations doubtless has done much to make this form of medicament popular among physicians. Speaking of this tendency, the editor of "Merck's Report" (June 15, 1897) says that progress in pharmacy is nowhere so well attested as in the isolation and establishment of identity and purity of these principles. When the active principles are administered all the useless extractive matter is absent, the bulk reduced accordingly, and the remedy rendered more acceptable to the patient. But while this practice has become common with a very large number of important drugs, this holds true only for those whose active principles are well recognized and obtainable of uniform composition. With others among them, the active principle of aconite cannot be prescribed with safety, since, for reasons not yet clearly understood, the chief alkaloid, aconitine, as extracted by different chemists differs very markedly in its toxic powers. In this direction, though wonderful advances have been made, chemistry has not kept pace with the device of doctors.

The convenience of division and administration of these active principles in the form of tablet triturates must be apparent to all conservative thinkers, and it is therefore proper that we inquire into the grounds that are brought forward both in their favor and in opposition. Thus the journal of the American Medical Association (October 31, 1896), brings an article in which the writer expresses the opinion that the so-called "tablet fad" has come to stay. He says that "the convenience, cleanliness and presumably accurate dosage of the preparations recommend them readily to the practitioner, and at the present time there is hardly a doctor's

office where the familiar glass-stoppered bottles and labels of the different manufacturers are not to be encountered." After discussing some of the objections that have been urged against this practice, notably by pharmaceutical writers, the writer continues: "All the objections to these tablets could, it would seem, be avoided if there were a standard list, made up mainly of simple drugs, a few well-tried or rational combinations, perhaps, included, which could be prescribed, if so desired, and supplied by every druggist, and which could be combined according to the needs of any special prescription if the physician desired to dispense his own medicines." Coming from the source it does, the editor of the American Journal of Pharmacy, believing that it may be accepted as expressing the views of at least some American medical men on the subject of tablet medication, subjects this writer's argument to editorial criticism. The claim that tablet medication is an injury to the business of the pharmacist, advanced by some writers, is one of the poorest arguments against the tablet which has been put forth. If this form of medication is a real advancement in the administration of medicine, then no consideration for any class of people will be entertained. The editor does not admit, however, that this form of medication is an improvement. Numerous experiments have been recorded in which it has been shown that tablets made from simple substances have been found utterly worthless, and this must be equally true with substances of a complex nature the quality of which is not so easily determined. There is another phase of the tablet question, which physicians themselves should see before it is too late, and that is the encouragement which, with its aid, the manufacturer holds out to the quack, and to self-medication. In the latter direction it is already at work, and we may soon expect to see physicians denouncing tablets as vigorously as they may now be inclined to praise them. Several papers have been read upon this subject before the Georgia Pharmaceutical Association at its annual meeting in 1896. Prof. George F. Payne observes that while the tablet triturate, upon the general ground that all fads have their day, may pass away among the have-beens, there are many points in favor of this method of rendering drugs portable. There are also some excellent reasons against their general use. While the demand lasts the pharmacist is bound to supply, but he believes the medical profession, to whom their convenience is almost a boon, will soon grasp the serious bearing which this very convenience has upon their practice, and that their use will in consequence be curtailed. It is not alone that physicians are led to use tablet triturates, on account of their convenience, in cases in which they are far from suited, but from a fad of the physicians, by infection, the tablet triturate will soon become a fad or habit with the people, and a fruitful source of self-medication. Then, as in the case of coated pills, manufacturers will begin to issue little pamphlets—perhaps with the title "Every Man His Own Doctor"—and supplying a family

medicine chest of tablet triturates, promote their sale by allowing each man to make his own diagnosis.

In reply to the same query, Mr. D. R. Stauffacher entitles his paper "Our Professional Cancer." He mentions that tablet triturates were first introduced and exploited by such a campaign of misrepresentation as is without parallel in the history of pharmacy. The manufacturer sent his representatives, not to the drug trade, but direct to the physician, assuring him that druggists could not be trusted to supply pure medicines, that they all purchased cheap drugs that they substituted, were counter-prescribers and nostrum-venders, and that consequently their only salvation lay in self-dispensing. Physicians adopted them on account of their convenience, and the plausible plea of accuracy and reliability, and they doubtless find useful application in emergencies and within certain limits in the practice of country doctors. But they have proven a boomerang to the doctor, since they have become one of the most prolific causes of self-medication by the public. Leaving out of question the injustice done to druggists by the venders of tablet triturates in representing them as a class to be substitutors, counter-prescribers, purveyors of bad medicines, etc., the result of the innovation has been that the dispensing patronage of druggists has been cut to pieces all over the country by this fad; and this in face of what the author believes to be a fact, that no line of pharmaceutical products on the market to-day are so utterly unreliable, taken as a whole, as tablet triturates.

In the third paper, Mr. George F. Bingham refers to manufactured goods generally as being the most popular medicines in demand in modern practice, but he considers tablet triturates to be the curse of the retail druggist, since there appears to be no limit to their *professed* usefulness. Every imaginable combination, however preposterous, is represented by the manufacturer as being available, and they are recommended on their label as sure cures for every known ailment. As a result they, fostered by the physician, have done more to promote self-doctoring than all other forms of medication combined. While there is evidence that the use of tablet triturates is on the decline, it will not do for the pharmacist to sit idly and with folded hands and await the evolution, but let him make every effort to discourage the use not alone of tablet triturates, but of ready-made fads of every description, and by convincing the physician of his ability and integrity to compound, pave the way to re-stocking his shelves with goods of his own manufacture, the composition of which he knows and can guarantee. Some years ago he had depended upon others for his stock of unofficial elixirs, wines, syrups, etc. He now prepares them by the formulas in the National Formulary, and has succeeded in acceptably replacing many of the specialties to the perfect satisfaction of physicians.

In a paper read before the Iowa Pharmaceutical Association, Mr. J. M. Henry speaks on the same question, but takes a more optimistic view of

the future than do the two preceding writers. Without claiming to be much of a prophet, he gives as his opinion that tablet triturates will not injure the drug trade to any great extent. He considers them a fad that, like a great many other fads, will pass away. He treats his subject rather from the humorous than the serious side, points out their supposed advantages and disadvantages, and comes to the final conclusion that "tablets are not in it," and that they will be short-lived.

Modernly the question repeats itself over and over, "How shall a pharmacist increase his business?" Some of the answers to this burning question have already been alluded to, but none of them are perhaps as true and to the point as that given by Mr. Gordon L. Curry in a paper read before the Kentucky Pharmaceutical Association, at its annual meeting in 1896. After reviewing some of the causes that make the pharmacist's business unprofitable, he suggests that his business may be influenced by advertising it—not by means of flaring newspaper head-lines and multicolored hand-bills, but by securing the reputation of carrying a complete stock of clean, fresh and pure drugs, and applying the same conditions to his shop and his business methods. It is a proper measure for him to call the attention of his neighbors to this, who, finding things as represented, will prove his best advertising medium. Among other measures that have been already alluded to is the popularization of

The National Formulary. This has been the subject of frequent discussion at the meetings of the different State Associations, and while the criticisms on the revised edition, as may be expected, are not always favorable, the work as a whole is uniformly recommended for adoption by those who aim to do some missionary work among physicians. Some interesting criticisms have been made by Rauschenberg and others in the "American Druggist," and such will doubtless receive due consideration by the Committee on National Formulary. Among criticisms is one made by the editor of "The Pharm. Era" (June 24, 1897), in regard to the change in the serial number of the formulas in the revised edition. It is pointed out that there lies an element of danger in this change, since prescribers might elect to designate a preparation of the National Formulary by its number instead of by its title, in which event the preparation would be a very different one with the original edition or with the revised edition before the dispenser. The editor of the "Era" observes that while there is perhaps not much force in the objection, it is wiser to err on the side of safety, and he suggests that in any forthcoming edition of the National Formulary no alterations of numbers of formulas now included should be made; additions, elisions, etc., being appropriately marked by either new numbers or *supplemental* numbers of some sort.*

* The reporter, as a member of the Committee on the National Formulary, desires to explain that this view has never presented itself to the Committee, the serial numbers of the formulas being intended for convenient reference when a preparation by any one formula is directed in the formula for another.

Among the factors that have had their influence upon modern pharmacy that of

"*Excessive business competition*" has been implied in the foregoing rather than stated. A recent comment on this subject, to the effect that "the pressure of competition is now and has always acted as the minister of natural selection," and that "it kills off the unfit and leaves the adapted in possession of the field," has led the editor of the "Pharm. Review" (July, 1896), to a somewhat lengthy and pointed criticism. He says if ability or fitness refers to business skill or sagacity, or even shrewdness, the comment is no doubt in part true; but the survival of the fittest in business, is a great lie, if by fit we understand honorable qualities. The observation can be made almost anywhere that, for example, an old reliable firm is reduced to the verge of bankruptcy because it has avoided distasteful methods of advertising to attract the public. Though no one will doubt that the articles bought at the old stand are reliable, that the veteran chief clerks at the heads of the various departments thoroughly know the kind of goods they are daily buying and selling; yet they succumb to the newcomer doing business on modern principles, and selling goods of good, bad and indifferent quality to a credulous public, blinded by the cheapness of the price and attracted by extravagant advertisements. What is true of the general merchant is even more true of learned professions and particularly of those callings that combine the professional and commercial elements. The druggist is in this particularly precarious position. He is suffering from nothing so much as from unrestricted competition. It is not to be wondered, therefore, that the pharmacist should grasp at all possible expedients to modify this condition and to elevate his professional standing. Thus the question of conferring

The Degree of Doctor of Pharmacy has been discussed in two papers read before the Georgia Pharmaceutical Association (1896). In one of these Mr. H. R. Slack expresses himself in favor of conferring the degree of Doctor of Pharmacy, for it will proclaim to the public, in no uncertain tones, that the pharmacist recognizes and is willing to assert his claims to professional recognition; but let the degree represent more than merely two or three years' professional training. We should not fall into the errors in this direction under which the professions of medicine and dentistry have suffered until very recent years, but, possibly by an association of American Pharmaceutical Colleges, fix a curriculum that will elevate the standing of pharmaceutical teaching, as well as that of pharmaceutical graduates. The second paper, a very spirited one by Mrs. Mallory H. Taylor, is also in the affirmative. Mrs. Taylor says, "We have all heard the old proverb which runs 'People will live up to their clothes.' Considering we all belong to that hard-working, threadbare class of society known as druggists, there is probably not a member of this assembly who has not felt his mental and possibly his moral barometer rise and fall according to the suit of clothes

he is wearing. As frivolous as this sounds, and although we may not be willing to own it except as applied to our neighbor, still in our innermost conscience we know it is the truth. The reason is simple enough. More is expected of a well-dressed person, and we are going to live up to the standard set for us." "This is just where the title of Doctor will assist us; it will raise the standard of public opinion. One trouble has been in the past that we have no goal of our own. We have accepted whatever position was doled out to us." After pointing out the direction in which the pharmacist must assert himself if he hopes to gain the recognition his professional functions entitle him to, Mrs. Taylor concludes: "Let us throw aside all hinderance till we force the people to acknowledge this profession as one of the foremost in the land! Leave the 'croakers' to sit on the fence and croak; they will never be missed. It is said that there is some one always on the watch to take the hindermost; by *all* means let him have *them* if he wants them." Coming from the pen of a woman these emphatic remarks remind us that we have

Woman in Pharmacy. Speaking of such, the editor of the "Pharm. Era" (June 3, 1897) observes that "a woman won one of the three prizes offered by the Georgia Pharmaceutical Association (1896) for the best practical paper read at the annual meeting. This would seem to dispose of the charge we have often heard that woman is not practical in pharmacy. But she is practical enough to win a prize for a practical paper on a practical subject, and what more can we ask? She is in pharmacy to stay, and the croakers must not croak too long, or, to use a slang expression, they'll be sure to croak in dead earnest in the near future." It is therefore interesting to note what the "Woman in pharmacy" has to say on the same and similar subjects. In a paper read before the Iowa Pharmaceutical Association (1896), Dr. Caroline Peterson, speaking of the slur that is often implied by the term,

"*The New Woman,*" observes that it is rather a difficult task to say anything on such a threadbare subject, for the "New Woman" is a fake. She does not exist in flesh and blood, and can only be found on paper. She is the same old woman she was 2000 years ago. She fills the same place to-day that God and nature intended her to fill, just as she has from earliest creation, and she will continue to fill it until the world ceases to be man's habitation. There are a great many women in the professions to-day, and it is right that they should be there. They are needed there; if they were not they would not be there. But there is nothing about that to bring down upon them the designation "New Woman." God and nature intended that man should be woman's protector; and if he is not, and woman tries to be her own, the fault lies with the man.

Mrs. Fletcher Howard, who also read a paper on this subject before the Iowa Association, on the other hand, contends that the "new woman" does exist, and that she is the necessity and logical outcome of the new

and advanced condition of affairs represented in the nineteenth century. New and hitherto unknown forces have combined to produce a spirit of unrest, which, breaking its barriers of custom and usage, has culminated in the embodiment, "new woman." Thus, mentally, we find that the woman of to-day is far in advance of the woman of the past. With increased opportunities for an education, which she improves to the utmost, woman's range of thought and action has broadened, until her horizon is only limited by her desires. The success which has crowned her efforts in the realms of medicine, surgery, law, politics, the pulpit, and the press, prove that to-day woman is the peer of her brother, man. All fields are now open to her—the professions, arts and skilled labor—and Mrs. Howard predicts that the phrase "new woman" will lose its reproach, and be the term by which husband, lover and son will be most proud to do her honor.

A third paper on this subject before the same Association, is that of Mrs. Florence Gratiot Bale, who had some things to say that gained for her the first prize, awarded by judges of her own sex. "What is this new woman who stands on the very threshold of the twentieth century, and by some seen as a prophetess, who relegates the women of the past to utter oblivion because they have not been politicians or lecturers on the long and serious sufferings of the female race? This new woman is not a new thing at all! for she has her prototype in every century, and some of our 'new women' will have hard work even to touch the skirts of their predecessors. As we view the woman's side of the question, and see her enter the trades and the professions, earning her own living by the sweat of her brow, we wonder what will become of the home, the husband and the children. Or, if they elect to remain unmarried—which they ought to if they enter the professions and business life—what will become of the race? It is right and proper for the woman who has made up her mind to brave life's uncertain ocean alone to give her life and talents to the world, be it in a great or small degree; she *must* have a resolute aim if she reaches the fullness of her womanhood. The women who make the best homes are those who have gone out along the highways and byways of life, met obstacles with a stout heart, and compelled the world to respect and honor them. But there is an ideal womanhood growing up in this great nation which will make more loyal Americans, better daughters, nobler wives and truer mothers. They will be independent, they will only marry when their hearts respond the words they utter at the altar. The ideal wife will be a partner of her husband in every branch of his life—in his business, in his pastimes, and in his church they will be one; he in the business world, she in the home life. But when it is argued that home is woman's kingdom, it is not to be understood that woman's aspirations and ambitions should not rise beyond its walls, and that woman should not escape the boundaries to which conservative men and some ecclesiastical bodies adjure them to keep. The ideal woman will be 'domestic,' and

she will take pride in being so called; but the new woman is to be the man's partner in all things, and so must be his partner in his business—with the woman's right to speak her mind about the store, and, reciprocally, the man's right to make a few remarks about the home."

Having of necessity only outlined the very interesting papers on the subjects of "Women in Pharmacy" and "The New Woman," this chapter, and with it this "Introductory," may properly be finished with the concluding paragraph of Mrs. Bale's very sensible paper:

"So let us wish the ideal woman God-speed. Not the fanatic who wants to be a man, who rails at men and home, but the new woman, who is the same dear old woman with this century's great advantage to help her keep pace with her father, brother, husband, and son, so that she may be his companion in home, in business, and in intellect."

Proceedings of the State Pharmaceutical Associations.

In the following a brief review of the proceedings of such State Pharmaceutical Associations as have reached the reporter is given. This review, as in last year's report, only gives the titles of the papers read at the annual meetings of these Associations, the more important of them having been either touched upon in the "Introductory," or are given in abstract in the body of this report under their proper headings. It was considered to be of interest here also to note the topics that have been discussed by the presidents of these Associations in their annual addresses, as well as those that have been the subject of special report. The reporter regrets that so small a number of Proceedings of State Associations has reached him; the more so because he confidently believes that a synopsis of these proceedings, if it could be obtained from all State Pharmaceutical Associations, would be of great and permanent value. In this connection also some observations on "Association Proceedings," made by the editor of the "Pharmaceutical Era" (Jan. 14, 1897), deserve the attention of these organizations. He says that the annual volume published by the average Pharmaceutical Associations lacks much of what should constitute such a work. Viewed collectively, these publications are "fearfully and wonderfully made," and they exhibit a wonderful lack of uniformity in conception, arrangement, style of indexing—if any index be given at all—and dimensions. Some of them really seem to have been gotten up without any comprehensive idea of their practical utility or the information they might furnish. Proceedings that are worth publishing at all possess intrinsic value, and they should fairly represent the aims of those men who have banded themselves together for "mutual strength and advantage."

Alabama.—The Fifteenth Annual Meeting of the Alabama Pharmaceutical Association was held at Opelika, May 12 and 13, 1896. Three sessions were held. The President, W. F. Dent, in his address speaks en-

couragingly of the interest manifested in the Association throughout the State. The following papers were read:

"Proprietary Medicines and Tablet Triturates the Curse of the Retail Druggist," by W. E. Bingham.

"Our Duty," by W. F. Punch.

Other subjects that were discussed by the Association were, Metric Weights and Measures, the Tax on Alcohol, and the Condition of Hospital Stewards in the Army.

Delaware.—The Tenth Annual Meeting of the Delaware Pharmaceutical Society was held at Dover, May 7, 1896. Two sessions were held. In the address the President, Clarence D. Sypherd, made some remarks on trade problems, especially that of the "Cut rate," and some recommendations concerning the Registration of Pharmacists and their Assistants. The following papers were read:

"Why we should Promote Pharmaceutical Education," by Howard M. Wilkinson.

"Is our Society a Benefit to its Members?" by Joseph P. Williams.

The discussions during the sessions were principally on topics of a routine character.

Georgia.—The Twenty-first Annual Meeting of the Georgia Pharmaceutical Association was held in Atlanta, May 5 and 6, 1896. Four sessions were held. In his address the President, David W. Curry, touched upon the objects and benefits to be derived from organization, deplored the lack of public appreciation, urged that continued efforts be made to expose adulterations and sophistications, and discussed the subject of tax on alcohol. He hoped for national recognition of pharmacists through the efforts being made to improve the status of the pharmacists in the army and navy, and expressed gratification at the brighter outlook of pharmacy which is brought about by the revival of industries throughout the South. The following papers were read:

"Is it advisable for the State Board of Pharmacy to establish an Educational Qualification for its Licentiates?" by R. H. Land.

"Will the Degree of Doctor of Pharmacy help to elevate the professional standing of Pharmacy?" two papers, one by Mrs. Mallory H. Taylor, the other by H. R. Slack.

"What Steps should be taken to secure Pharmacists in the Army, the Navy, and the Marine Hospital Service of the United States, the recognition which they deserve?" George F. Payne.

"What Method should be used to get the best therapeutic effects from Saw Palmetto Berries?" I. A. Solomons.

"Formula for Chatham Artillery Punch," by Ed. J. Kieffer.

"What Amendments are needed to our Pharmacy Laws as they now stand?" by John W. Goodwyn.

"Aromatic Spirit of Ammonia," by J. D. Perse.

"Reflections of a Practical Druggist," by S. C. Parsons.

"What is the Future of Tablet Triturates?" two papers, one by D. R. Stauffacher, who entitles his paper "Our Professional Cancer," the other by Geo. F. Payne.

The discussions during the sessions were on these papers and several important committee reports on adulterations, on trade interests, on extending the status of pharmacy legislation, &c.

Illinois.—The Twentieth Annual Meeting of the Illinois Pharmaceutical Association was held in Springfield, July 28 and 29, 1896. Four sessions were held. In his address the President, J. Henry Sohrbeck, discussed the patent medicine evil, and called attention to the benefit that may be derived from a popularization of the National Formulary. He spoke of the changes that had been brought about by the affiliation of the Chicago College of Pharmacy with the University of Illinois, of the effect of the new pharmacy law, called attention to the agitation concerning the compulsory use of the Metric system, and expressed his satisfaction on the repeal of that portion of the Wilson bill providing for free alcohol for use in the manufacture of medicines, &c. The following papers were read:

"An Analysis of 171,000 Prescriptions," by Geo. E. Case.

"Syrupus Eriodictyi Aromaticus, N. F.," by J. E. Huber.

"Classification of 10,000 Prescriptions," by C. S. N. Hallberg.

"On the Purity of Commercial Chemicals," by Wm. A. Puckner and A. D. Thornburr.

These papers, together with reports of Committees on Legislation, Revision of the U. S. Ph., Trade Interests, Adulterations, Status of Pharmacists in the Army, the Co-operative Manufacturing Company, on Apprenticeship, and several minor reports, furnished abundant subjects for discussion during the several sessions of the meeting.

Indiana. The Fifteenth Annual Meeting of the Indiana Pharmaceutical Association was held in Indianapolis, June 3 and 4, 1896, the business being transacted during five sessions. In his address, the president, Thos. J. Moffett, discussed ways and means for enlisting the interest of the Indiana pharmacists in the aims and objects of the Association, and thus to secure the aid and counsel of every pharmacist in the state in controlling the cut-rate evil, in neutralizing the inroads made by manufacturers in creating the demand for their specialties, and to unite in efforts to restore to pharmacists, in some degree at least, the privilege of supplying medicines of their own manufacture. A paper was read

"On Gamboge of the Market," by E. G. Ebert.

Several interesting addresses were delivered by visitors from other associations, one by Prof. J. M. Good and another by Dr. Brayton. Interesting reports and subjects discussed during the meeting were the following: the proper pharmacy law, trade interests, adulterations, the United States Pharmacal Company, an institution organized under the auspices of the

Illinois Pharmaceutical Association, the Metric system of weights and measures, education, insurance, etc.

Indian Territory. The Second annual meeting of the Indian Territory Pharmaceutical Association was held at Wagoner, May 19 and 20, 1896. Three sessions were held. In his address, the president, H. C. Cobb, notes a healthy increase in membership, bespeaks a prosperous future for the Association, deplores the absence of a pharmacy law in the Territory, and advises concentration to secure proper legal restriction to the practice of pharmacy in the near future. The following papers were read:

"How to make the Association a Success," by E. P. White.

"Should Indian Territory druggists handle Alcohol?" by W. O. Shannon.

"The United States Pharmacopœia," by J. L. Beardsley.

"A few reasons why we should dispense our own preparations," by H. H. Hokey.

Other interesting topics that came up for discussion make it clear that this Association, though young in years, will easily maintain its position in line with the older associations.

Iowa. The Seventeenth Annual Meeting of the Iowa Pharmaceutical Association was held at Clear Lake, June 15, 16 and 17, 1896. Four sessions were held. In his address, the president, M. W. Ward, attributed the depression in the drug business largely to the failure of farmers to profitably realize their crops; congratulates the pharmacists of Iowa on the failure of the "Pure Food Bill" to become a law, since, however acceptable in title, it was full of iniquitous restrictions and unnecessary burdens upon the druggists of the state; deplores the prevalence of substitutions, and the "cut-rate evil," and the ever-increasing practice of tablet-triturate prescribing; gives the revised National Formulary a gentle kick; and concludes with the wholesome advice to the members present at the meeting that they "enjoy their idling by working hard for the good of the Association." The following papers were read:

"Is the compounding of Physician's Prescriptions to become one of the lost arts in the drug store?" two papers, by J. W. Ballard and by A. J. Williams.

"The relation of the Retailer to the Jobber," by R. E. Tailer.

"The Tablet Triturate," by Charles Johnson.

"Tablet Triturates: How they may Affect the Pharmacist in the Future," by J. M. Henry.

"Side Lines: Are they Profitable?" two papers, by J. W. Ballard and by Mrs. Carrie S. Collins.

"The New Woman," three papers, by Dr. Caroline Peterson, by Mrs. Fletcher Howard, and by Florence Gratiot Bale.

Kentucky.—The Nineteenth Annual Meet of the Kentucky Pharmaceutical Association was held at Estell Springs, June 16, 17, 18 and 19, 1896. Five sessions were held. In his address the President, Addison Dimmitt,

discussed the efforts being made to secure an extension of the pharmacy law so as to apply to all the pharmacists in the State; pointed out the advantages of local organization and co-operation in regulating commercial difficulties arising in the drug business; reviewed the beneficent results secured by bringing the National Formulary to the notice of the medical profession by circulating an epitome of its contents among them; urged systematic efforts to secure all the druggists of the State in membership; and outlined a plan for securing more papers at the annual meeting of the Association.

Only two papers were read, both by the same author.

"Bacteriology for the Pharmacists," by Gordon L. Curry.

"The Retail Pharmacist," by Gordon L. Curry.

Among the important reports present and discussed were the following: On Legislation, On New Preparations, On Correspondence with other Associations.

Michigan—The Fourteenth Annual Meeting of the Michigan State Pharmaceutical Association was held at Mackinac Island, August 4, 5 and 6, 1896, three sessions being held. The President, G. I. Ward, in his address, after calling attention to and discussing the conditions that modernly confront the druggist, suggests the following measures as being calculated to ameliorate the burden under which he now struggles for existence: 1. It is to the interest of the public as well as due to the druggist, that the handling, dispensing and vending of all drugs and medicines, and especially poisonous and dangerous articles, be restricted and confined to the drug trade exclusively. 2. To enable the druggist to know what he is selling, and to enable the physician to know what he is prescribing, no preparation or medicine should be permitted to be sold or dispensed unless its formula is published or is on file with the vendor. To bring about these reforms, each one can do something for himself, but as an organized body much can be accomplished. "We are passing through a period of depression, both business and professional, but I think I can see a bright light ahead: therefore, let the weak take heart and the strong encourage the weak, but let none stand aloof like cowards, while others fight their battles."

The following papers were read:

"Advertising a Drug Store," by Anderson.

"U. S. Pharmacopœial Standards Compared with Foreign Pharmacopœial Standards," by C. C. Sherrard.

"Tincture of Iodine," by A. B. Stevens.

The papers, with the reports on Trade Interests and Adulterations, afforded interesting subjects for discussion.

Minnesota—The twelfth annual meeting of the Mimnesota Pharmaceutical Association was held at Lake Park Hotel, Lake Minnetonka, June 16, 17 and 18, 1896. Five sessions were held. In his annual address the

president, Wm. Gausewitz, called attention to several children of the Association—the College of Pharmacy connected with the State University, and the Minnesota Pharmaceutical Manufacturing Co.—both of which have manifested beneficent influence upon the condition of pharmacy in the state, the one by inculcating pharmaceutical knowledge, the other by advancing trade interests. He also eulogized the parent Association, and advised and admonished the members of the Minnesota Association to join the national body, and thereby increase its usefulness. The following papers were read:

"Historical Sketch of the College of Pharmacy in the University of Minnesota," by Prof. F. J. Wulling (a continuation of a previous paper, 1895).

"The Function of Pharmacy in the Social Body, its Responsibilities to the Public and to the Physician," by Prof. Albert B. Prescott, of the University of Michigan.

"Glycerine Soaps," by L. A. Harding.

"Blaud's Pills," by L. A. Harding.

"Glyceryl Borate," by Truman Griffen.

Among the reports presented the one on Adulterations requires special mention, since it gave the results of examination of a very large number of commercial chemicals and pharmaceutical preparations which will be found very useful for reference. Other important reports received and discussed were: on Legislation; on College of Pharmacy; and on Trade Interests.

Nebraska.—The fifteenth annual meeting of the Nebraska State Pharmaceutical Association was held at Lincoln, June 2, 3 and 4, 1896. Four sessions were held. In his address the president, L. Wilson, gave a brief historical sketch of the Association; discussed the cut-rate evil and some of the peculiarities of the state liquor law in its application to the drug store; deplored the lack of interest taken by members in regard to preparing papers to be read before the Association; referred favorably to the bills before Congress advancing the status of pharmacists in the army and navy, and making the metric system of measures compulsory; and spoke a good word for the National Formulary, which should receive the attention of all pharmacists, and through them should be brought to the notice of physicians. The following papers were read:

"Patent and Proprietary Remedies," by John H. Bot.

"Chemistry as We Find It," by W. M. Touner.

"Indigenous Medicinal Plants," by Mrs. Belle C. Heilman.

"The Drug Business in Western Nebraska," by Geo. H. Moore.

"Side-Lines," by Mrs. Belle C. Heilman.

The subject of Trade Interests, in its various phases, was very thoroughly discussed during several of the sessions.

New Hampshire.—The twenty-third annual meeting of the New Hamp-

shire Pharmaceutical Association was held at Concord, September 3 and 4, 1896. Three sessions were held. In his address the president, Chas. B. Spoffard, refers to the dearth of papers, the cause of business depression, and the desirability of further legislative enactments; touches briefly upon the theme of "the cut-rate problem," and discusses expedients that may induce pharmacists to join the Association and attend its meetings. There were no papers read or presented, and the reports were simply of a routine character.

New Jersey.—The twenty-sixth annual meeting was held at Lakewood, May 6 and 7, 1896. Two sessions were held. In his address the president, Chas. F. Dare, discussed the advantages resulting from the recent amendment to the pharmacy law, which he now regards to be sufficiently good. He urges that further legislation would result in harm, and should be discouraged; maintains that the complaints and protests made concerning the severity of examination by the Board of Pharmacy are not justified and are made thoughtlessly, and that they are not more stringent than the interests of good pharmacy and the public demand; touches briefly upon the subject of "trade interests," and in this connection recommends the more general use and discrimination of the revised National Formulary, that pharmacists should make up a line of preparations selected from it, and canvass them among the physicians of the state. The following papers were read:

"A ready method for the detection of Acetanilid when used as an adulteration of Phenacetin or Antipyrine," etc., by Donald Cameron.

"Resin of Pohophyllum (Podophyllin)," by Herman J. Lohman.

"Notes from the Laboratory and Dispensing Counter," by August Drescher.

"Substitution," by W. C. Alpers.

The reports received and discussed were of local importance only.

New York.—The Eighteenth Annual Meeting of the New York State Pharmaceutical Association was held at Buffalo, June 23–26, 1896. Six sessions were held. In his address, the President, George J. Seabury, dealt largely with the several Boards of Pharmacy now exercising their respective functions within the State of New York. He strongly advocated the consolidation of the four Boards, and that, in order that the Association may itself support a single Board of Pharmacy acceptably, it should completely reorganize under a new Constitution and By-Laws. In support of his plea for these changes, he cites certain questions and the answers received from members of the Board of Pharmacy of different states. He makes some pertinent remarks on the proprietary medicine and cut-rate questions, on free alcohol, on excise legislation, on the Metric system, on the standing of the military and naval pharmacists, and closes with the advice that a committee on fraternal and professional relations be appointed to visit all medical meetings in the state, and for conference with a simi-

lar committee from the Medical Society, for the purpose of adjusting such grievances as may exist between the two professions. The following papers were read:

"The Raines Liquor Law," by William Muir.

"Office and Influence of Pharmaceutical Journals," by Albert H. Brundage.

Besides other reports, more or less of local importance, a report on new remedies, giving a concise description of their nature or uses, or both, deserves attention.

North Dakota.—The Eleventh Annual Meeting of the North Dakota State Pharmaceutical Association was held at Fargo, July 21 and 22, 1896. Three sessions were held. In his address, the President, G. A. Day, considers in general terms the advance made by the Association, and bespeaks continued prosperity for the future. There were no papers presented at this meeting. An address was delivered by Prof. C. S. N. Hallberg, of the Chicago College of Pharmacy, entitled, "How May the Pharmacist Escape?" in which, referring to the all overpowering tendency of the day to monopolize, he aims to explain how by "education," by "legislation" and by "co-operation," the pharmacist may escape from the adverse conditions under which he is now laboring.

Ohio.—The Eighteenth Annual Meeting of the Ohio State Pharmaceutical Association was held at Put-in Bay, June 30 and July 1, 1896. Five sessions were held. In his address, the President, C. W. Tobey, congratulated the Association on the efforts and progress made during the past year to place pharmacy on a higher plane by judicious legislation; discusses the inroads made by non-professional dealers in handling proprietary and similar medicines, more as an advertising medium; recommends the appointment of a conference committee to advise with the State Food and Dairy Commissioner for the purpose of setting the limit of variation in drugs, chemicals, etc.; suggests that both cities and counties form local Associations for mutual benefit and protection; to guard against adulteration and to uphold a recognized standard; to enforce registration and punish violation; and to promote acquisition of membership in the State Association. The following papers were read:

"A Standard for Drugs," by John Uri Lloyd.

"The Genesis of Pharmacy," by Anthony W. Blackburn.

A number of reports of local interest were read and discussed. The report of the Committee on Adulterations deserves special attention.

Pennsylvania.—The Nineteenth Annual Meeting of the Pennsylvania Pharmaceutical Association was held at Mt. Holly Springs, June 16, 17 and 18, 1896. Six sessions were held. In his address, the President, Hugh N. Cox, after briefly alluding to the Philadelphia College of Pharmacy and the influence this, the pioneer in pharmaceutical college work, has exerted upon American pharmacy, spoke commendably of the earnest efforts

of the American and State Pharmaceutical Associations to secure an improvement in the status of pharmacists in the Army and Navy. He alluded to the "Alcohol Question" as a problem apparently very difficult of solution. Concerning the pharmacy law of the State he mentioned that, while efficiently administered it admits of improvements that will better satisfy the progressive interests of true pharmacy; expresses the hope that by special efforts the membership of the Association may largely increase, and suggests that the increased number of formulas in the revised National Formulary may be a profitable field for investigation and report at a future meeting. The following papers were presented at this meeting:

"Synthetic Oils," by Joseph Cave.

"Drummers," by Samuel H. Hill.

"Solid Extracts and their Standardization," by Charles H. LaWall.

"The Making of an Herbarium," by C. B. Lowe.

"Shorter Hours," by Wm. H. McGarrah.

"Detection of Acetanilid in some Closely Related Synthetic Remedies," by Frank X. Moerck.

"Notes on Assaying Opium, etc.," by Lyman F. Kebler.

"Sumbul Root of Commerce," by John H. Hahn.

"A Brief History of Scheele and His Discoveries," by Emil Ott.

"How can the Microscope be made Valuable to the Pharmacist?" by Emil Ott.

"Hoffman's Anodyne—Is its use decreasing?" by Emil Ott.

"Syrup of Krameria—Can a Permanently Clear Preparation of Official Strength be made?" by Emil Ott.

"Tinctura Opii Camphorata—Can it be made advantageously with the Tincture in place of the Powdered Opium?" by Emil Ott.

"Syrup of Hypophosphites with Iron—Can the Official Directions be Improved?" by Emil Ott.

"Counter Prescribing by Pharmacists—Is it justified?" Five papers, by S. H. Hill, by Wm. B. Thompson, by John F. Patton, by F. W. E. Stedem and by A. W. Miller.

"Is the sale of Patent Medicines on the decrease?" by S. H. Hill.

"Compressed Carbonic Acid Gas—Its use for soda water?" "Rock Candy Syrup," by S. H. Hill.

"How can rubber articles be softened?" by S. H. Hill.

"Eminence in Pharmacy," by Wm. B. Thompson.

"Are many of the so-called Malt Extracts sold little or nothing more than strong beer?" by Louis Emanuel.

"Preliminary Education of Apprentices," by F. W. E. Stedem.

"Interchangeable Certificates between Boards of Pharmacy," by F. W. E. Stedem.

"Bourbon Vanilla Beans—How do they compare in value with Mexican Vanilla?" by Lehn & Fink, through E. Ott.

Reports of general interest presented and discussed were: On the Metric System of Weights and Measures, Adulterations, and Free Alcohol.

Tennessee.—The Eleventh Annual Meeting of the Tennessee State Druggists' Association was held at Chickamauga, July 15 and 16, 1896, four sessions being held. The President in his annual address briefly reviewed the progress and achievements of pharmacy during the past year, deplored the fad now becoming so popular with colleges of pharmacy to abolish the experience requirement, and spoke favorably on the legislative requirements which compel licentiates of their Boards of Pharmacy to have a practical experience. He congratulates the retail profession upon the repeal of the "free alcohol" clause by Congress, and expresses the hope that the efforts now being made to improve the status of the pharmacists in the army and navy, and to make the Metric system of measurements compulsory in the United States, may eventually be crowned with success. The following papers were presented and read:

"Why I am a Member of the American Pharmaceutical Association," by J. P. Burge.

"Education of the People," by E. A. Ruddiman.

"The Board's Investigations," by R. H. Gordon.

"Chemical Analysis," by G. C. Childress.

"Saccharin," by R. H. Gordon.

"Some Incompatible Prescriptions," by E. A. Ruddiman.

Routine reports only were presented and discussed.

Wisconsin.—The Sixteenth Annual Meeting of the Wisconsin Pharmaceutical Association was held at Stevens Point, August 11 and 12, 1896. Five sessions being held. In his address the President, F. W. Thieman, observes that the membership—now 450—should be increased so as to embrace all the registered pharmacists (1629) in the State; for the only way to check the growing evils existing in the drug trade is to secure the united action of all the retail druggists. He also suggests and outlines some important changes to perfect the existing pharmacy law. The following papers were read:

"Tincture of Opium," by W. P. Clarke.

"Does It Pay Druggists to Attend Meetings of Pharmaceutical Associations?" by F. W. Thieman.

"The School of Pharmacy," by Edward Kremers.

"Should Pharmacists Patronize Any Manufacturer who Solicits Orders from Physicians?" by A. A. Pardee.

"Does It Pay Pharmacists to Carry a Full Line of Spices and Push the Sale of Same?" etc., by Herman L. Emmerich.

"Elixirs and Medicated Wines of Manufacturers—Do They Generally Contain the Stated Amount of Medicine?" by Conrad Engsberg.

"Chemical Composition of Kava Kava," by Arthur Bessingham.

"The Woman of Yesterday, To-day and To-morrow," by Rosa Upson Liebig.

An interesting report on adulterations was presented and discussed.

In this connection attention may here be called to the fact that

The Second Pan-American Medical Congress met in the city of Mexico during the week beginning November 16, 1896. The attendance, though not as large as upon the first congress, which was held in the city of Washington in 1893, was very satisfactory, there being over five hundred delegates present, many of whom contributed papers upon subjects kindred to the work of the congress. The number of regular papers presented in the different sections was over 250, but in addition to these a large number of volunteer papers were presented. The American Pharmaceutical Association was represented by the presence of two of its members as delegates, Professors J. P. Remington and H. H. Rusby, both of whom have been honored by being appointed to the chairmanship of important commissions—the detailed work of the congress *ad interim* being delegated to sections or commissions—Prof. Remington being chairman of the Commission on Pan-American Pharmacopœia, and Prof. Rusby chairman of the Commission on South American Flora. The delegates to this congress are enthusiastic in their appreciation of the extraordinary interest that has been manifested by the President and members of the Mexican government in the work of the congress, and of the bountiful hospitality and courtesy shown the delegates everywhere. The next congress will convene in Caracas, Venezuela, in 1890.

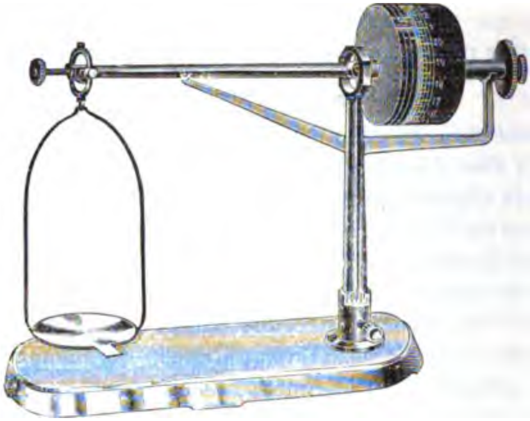
PHARMACY.

A. Apparatus and Manipulation.

WEIGHTS, MEASURES AND SPECIFC GRAVITY.

Micrometer Balance—A New Form of Prescription Balance.—At a pharmaceutical meeting of the Philadelphia College of Pharmacy attention was called to a new form of prescription balance, manufactured by the Micrometer Balance Scale Co., of Troy, N. Y., which is shown by the accompanying cut (Fig. 1). The arms are of unequal length and there is but one pan. The knife edges are delicately adjusted and the ordinary weights are discarded. The principal feature of the device is embodied in two graduated cylinders, in combination with a screw. The inner cylinder is rigidly attached to the arm, and by moving the outer cylinder either to

FIG. 1.



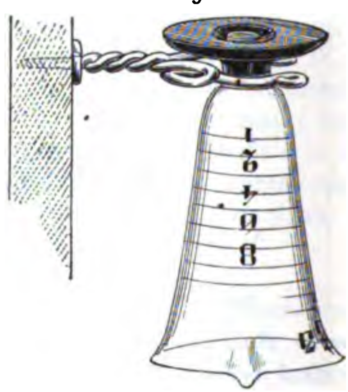
Micrometer Balance.

or from the fulcrum, weighing is accomplished, the weight being read on the index.—Amer. Jour. Pharm., March, 1897, 166.

Graduate Rack—Convenient Construction.—Neidlinger Bros., of New York, have placed upon the market a convenient form of graduate rack (which is shown by Figs. 2 and 3). The racks are made in three differ-

FIG. 2.

FIG. 3.



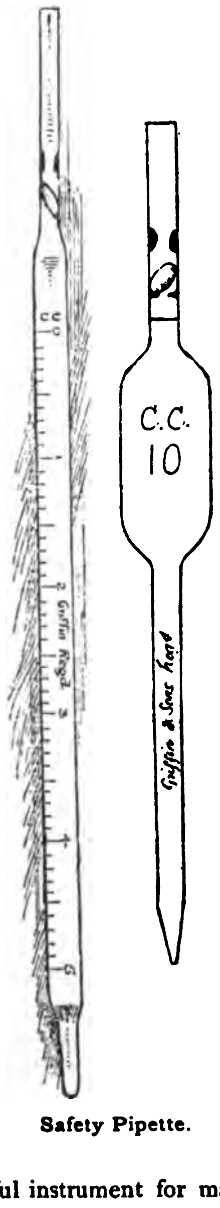
Graduate Rack.

ent sizes of heavy, tinned wire, and are sold in sets of three at a reasonable price.—Amer. Drug., Feb. 10, 1897, 97.

Safety Pipette—Simple Construction—At the meeting of the British Pharm. Conference, E. W. Lucas described a simple device for pipettes to

prevent the rise of fluids measured in them beyond a certain height, and particularly to prevent such fluids from being sucked up into the mouth. The pipette, which is shown in the accompanying cut (Fig. 4), is constructed with a somewhat elongated mouthpiece, with two constrictions about an inch apart. The upper constriction is ground smooth inside, the lower one is imperfect, while between the two is a loosely-working glass plug. The liquid is sucked up in the usual way, but as soon as it touches the plug this is carried upward and forced into the upper constriction, into which it fits accurately, and thus completely prevents the further ascent of the liquid.—Yearbook of Pharmacy, 1896, 300, 301.

FIG. 4.



Safety Pipette.

Dropper—A Useful Form.—Dr. Walter F. Chappel calls attention to a new medicine dropper, shown by Fig. 5, which is designed primarily for the application of greasy liquid compounds to the nasal passages, but is a

FIG. 5.

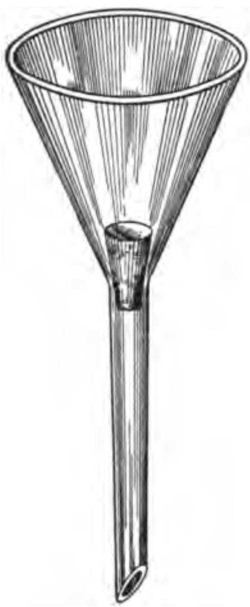
Dropper.

useful instrument for many purposes that will readily suggest themselves, since the medicine or other liquid is prevented from entering the rubber

bulb by the peculiar construction of the dropper.—Amer. Drug., Oct. 25, 1896, 281.

Dropping Funnel—Convenient Arrangement.—Dr. George F. Payne suggests as a convenient arrangement for dropping liquids the funnel shown by Fig. 6, which is constructed as follows: Select an ordinary glass funnel, the tube of which will readily pass into the neck of the bottle containing the liquid to be dropped, and press a cork lightly into the throat of the funnel, as shown in the accompanying illustration. The liquid is poured into the funnel, and the cork is gently loosened with the fingers if the quantity of fluid is small, or with a glass rod if the fingers are likely to be soiled, until the liquid begins to drop. The dropping is under absolute control, can be made rapid or slow, or stopped as desired. The balance of the fluid can be readily returned to the container by inserting the fnnnel and loosening the cork.—Drug. Circ., June, 1897, 159.

FIG. 6.



Dropping Funnel.

Drops—Variation in Size from the Same Liquid.—Dr. George F. Payne observes that the variation in size of the drop furnished by different liquids is well understood, but the large divergence in the size of drops yielded by the same fluid, even under ordinary conditions, is not so fully appreciated. Pharmaceutical literature acknowledges the unreliability of the drop as a method of measurement, yet with singular unanimity gives approximating numbers of drops to the fluid dram for similar liquids. This would leave one unfamiliar with the facts to infer that the number of drops to the fluid dram of any given fluid is fairly constant, which is far from being the case, unless much more than usual attention is paid to the proper conditions to secure what might be called the recognized drop of any given liquid. The use of the drop as a means of measurement is on a par with that of the pinch and handful, and all three are quite unsuitable for potent drugs. To show how widely drops of the same liquid will vary in size when obtained under different conditions, experiments were made with water, which is much used as a menstruum, and fairly represents several powerful preparations. A fluid dram was dropped under the varying circumstances noted below, with a yield in drops as stated:

From the bottom of a ten-ounce evaporating dish, the number of drops was 18.

From a two-pint funnel, choked with cork for dropping, square, thick end, 24.

From the bottom of a five-ounce beaker, 25.

From a six-ounce funnel, choked with cork for dropping, square, thick end, 28.

From a large glass stopper, two inches in diameter, 30.

From a five-ounce lipped beaker, with guiding-rod, $\frac{3}{8}$ inch in diameter, 31.

From a $\frac{3}{8}$ inch guiding-rod, taking supply from two-ounce dropping funnel, 32.

From a four-ounce glass stopped bottle (half full), stopper kept partly in neck, 33.

From a two-ounce lipped graduate, offhand, without guiding-rod, 45.

From a one-dram lipped graduate, offhand, without guiding-rod, 47.

From a two-ounce funnel, choked with cork for dropping, slanting end, 52. (See " Dropping Funnel.")

From a $\frac{3}{16}$ inch diameter guiding-rod, taking the supply from two-ounce dropping funnel, 62.

From a $\frac{3}{16}$ inch diameter guiding rod, taking the supply from one-dram graduate, 96.

From a $\frac{1}{8}$ inch diameter guiding-rod, taking the supply from two-ounce dropping funnel, 96.

From a five-ounce lipped beaker, offhand, without guiding-rod, 100.

From a five-ounce lipped beaker, with guiding-rod $\frac{3}{16}$ inch diameter, 120.

From a pointed guiding-rod, $\frac{1}{24}$ inch diameter at point, from two-ounce dropping funnel, 160.

From a pointed guiding-rod, $\frac{1}{40}$ inch diameter at the point, from two-ounce dropping funnel, 600.

The drops which were obtained with the very small guiding-rods and from the bottoms of the vessels were abnormal, and are only given to illustrate what is possible under certain conditions. The list, however, shows quite plainly how easy it is to obtain drops of water under ordinary circumstances, varying from 33 to 120 to the fluid dram.

Other condition, that influence the size of drops of the same liquid from same vessel are variations in temperature and the rapidity of the dropping. —Drug. Circ., May, 1897, 121–126.

Specific Gravity Bottle (Pyknometer)—Improved Construction.—For a number of years Dr. Edward R. Squibb has, at different times, called attention to improvements of the specific gravity bottle, as in 1883, in 1884, and last, in 1889 (see Proceedings, 1890, 295). He has now still further improved upon the form of 1889, the present form being in use during the past five years with very satisfactory results. The improvement aimed at in the construction of these bottles, as already explained in the previous papers mentioned, is to have a single bottle in which the standard water-volume can be accurately measured at all the different temperatures that have been proposed or adopted by different authorities (those most com-

monly used being 0° C., 4° C., 10° C., 15° C. and 15.6° C.) and in which liquids can without loss be brought to room temperature for weighing. By the adjoining cut (Fig. 7) it will be seen that the mechanical construction is that of an ordinary thermometer, and as far as temperature

FIG. 7.

Specific Gravity Bottle (Pyknometer).

is concerned the principle of action is the same. It therefore has a thin glass bulb—the bottle—a graduated stem, and a safety reservoir, the graduated stem being ground into the bottle for facility of filling and emptying. The graduation of the stem is arbitrary, and may be 0 to 50 or 0 to 100.

The use of the bottle and its parts will be easily understood from a description of its adjustment. As received from the glass blower, the chemically cleaned and tared bottle should hold say 100 Gm. of recently boiled distilled water at 20° C., at about 58 divisions of the scale of 0 to 100, the fine adjustment to 0.001 Gm. being made by the aid of very narrow strips of blotting paper that will pass easily down the bore of the graduated stem and absorb the minute excess of liquid. When the 100 Gm. is in the

bottle the little stopper is put in at the top, the leaden weight is put on the neck, and the whole is immersed in a bath at 0° C. until the column of water in the stem ceases to fall. It should then read at 0, or not much above it, and the reading be noted. If it reads below 0 the bottle is too large, and the stopper part of the stem must be ground further into the neck until the reading on the new trials brings the column above 0 at 0° C. Then the bottle is put into a bath at 25° C., and kept there with stirring of the bath until the column ceases to rise, when it should read somewhere from 90 to 100 of the scale. Should it read above 100 of the scale, while the lower limit is as far above the 0 of the scale, then the bottle is too small and the end of the stopper must be ground off until the reading of the column at 0° and at 25° C. is within the arbitrary scale at both ends. As with thermometers, this instrument will vary until it has been seasoned. In the case of 100 Gm. pyknometer shown in the cut, the column moved up and had to be corrected during the first two years, but of late years it has been constant.—Ephemeris, vol. iv., No. 5 (January, 1897), 1771–1775.

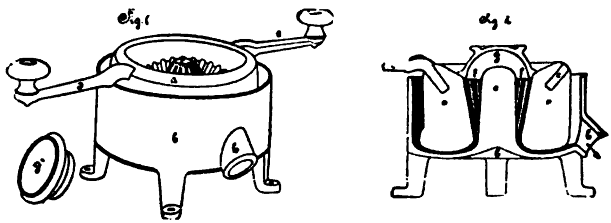
Viscosimeter—Application of the "Hydrometer" to Gum Solutions.—Lunge describes a simple instrument by means of which the relative viscosity of solutions of gum can be readily determined. The principle of the working of this instrument, which he calls a viscosimeter, depends on the time taken for a given body to sink in a liquid. It is, in fact, a hydrometer, consisting of a glass tube 20 Mm. in diameter and 100 Mm. long, terminated by a narrow stem 8 Mm. in diameter and 125 Mm. long. This smaller tube is graduated from 1.050 to 1.400, corresponding to the densities indicated by those figures. The total weight of the instrument is about 39 grammes. The gum solution, brought to about 15° C., is placed in a cylindrical glass and the viscosimeter allowed to sink in it up to the mark 1.200; it is then withdrawn and allowed to drain for three minutes, being held above the solution by a small clamp fixed to a stand; the extremity of the instrument is then adjusted to exactly touch the surface of the liquid, the time taken with a seconds watch, the clamp released, and the time again taken when the number 1.200 is reached on the stem. This method affords very useful data in the examination of gums.—Pharm. Journ., Nov. 28, 1896, 459; from "Mercure Scientifique."

COMMINUTION.

Comminution Mill—Novel Construction.—Max Kaehler & Martini, of Berlin, manufacture the mill shown by Fig. 8, which is intended to furnish a strong yet not too expensive comminution apparatus for technical laboratories. It consists of a very heavy iron mill-work *a*, and an iron vessel *b*, in the middle of which a slightly conical-grooved tongue *c* passes through the center of the hopper *f*. The arms *d* and *e* are fastened to opposite points of the mill work. The substance to be comminuted is well dried, placed into the hopper, the handles inserted, the cover *g* fastened and the

handles moved forward and back. As soon as the larger pieces are crushed, one of the handles is removed and the other turned in a circle—like the handle of a small coffee mill—until all the material has been forced

FIG. 8.



Comminution Mill.

out through the lateral opening *h*. The mill can be firmly screwed to a table, and is easily cleaned with a brush.—Pharm. Rev., June, 1897, 116.

SOLUTION.

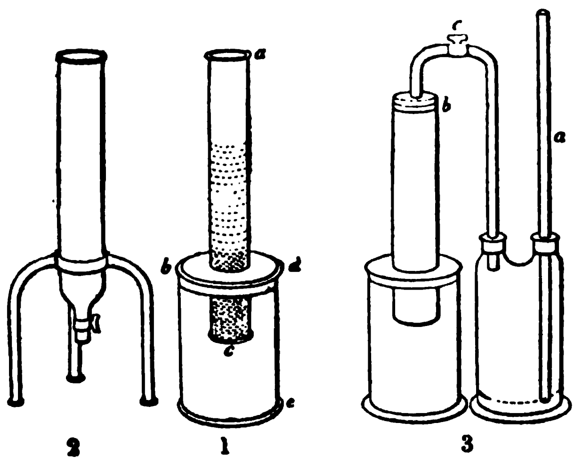
Percolation—Early Adoption by the Edinburgh Pharmacopœia.—The claim made by the "American Druggist," that the credit of first making percolation an official process is due the United States, is met by a counter-claim in the "Chemist and Druggist" (June 12, 1897, 922) that this credit really belongs to the Edinburgh Pharmacopœia. It is true that the process was adopted by both Pharmacopœias in their edition of 1840; but the U. S. P. 1840 did not appear until 1843, while the Ed. Ph. 1840 was published in 1839. The latter gives a very clear description of the process, as follows:

"A much superior method has been lately introduced, which answers well for most tinctures—namely, the method of displacement by percolation. According to this process, the solid materials, usually in coarse or moderately fine powder, are moistened sufficiently with the solvent to form a thick pulp. In twelve hours, or frequently without any delay, the mass is put into a cylinder of glass, porcelain or tinned iron, open at both ends, but obstructed at the lower end by a piece of calico or linen, tied tightly over it as a filter; and the pulp being packed by pressure, varying as to degree with various articles, the remainder of the solvent is poured into the upper part of the cylinder, and allowed gradually to percolate. In order to obtain the portion of the fluid which is kept in the residuum, an additional quantity of the solvent is poured into the cylinder until the tincture which has passed through equals in amount the spirit originally prescribed. [The displacing of the residual spirit by water is then described.] The method by percolation, where applicable, will be found much more convenient and expeditious than the mode hitherto commonly followed; and it exhausts the matters in general much more completely. As considerable

practice, however, is required for managing the details in different cases, more especially in regard to the degree of minuteness in the division of the solids, and the degree of firmness with which they are to be packed in the cylinder, we have thought it right to direct that the method by maceration may be employed as an alternative. But the method by percolation is now preferred by all who have made sufficient trial of it to apply it correctly."

The Ed. Phar. names the tinctures which could not be conveniently prepared by percolation, as well as those which could be, the latter embracing about forty different kinds. In "Christison's Dispensatory," edition 1842, the percolator contemplated by the Edinburgh Pharmacopœia is shown as in the accompanying cuts (Fig. 9, 10, 11), and a very full description of

FIG. 10. FIG. 9. FIG. 11.



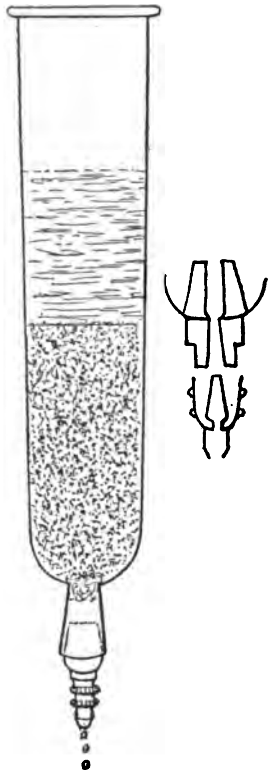
Percolators.

the process is also given. The percolator, Fig. 9, is covered with calico at *c*, and being provided with a broad rim, *b* and *d*, it rests upon the rim of the jar *e*, or is fitted into its orifice by the aid of a cork. In Fig. 10, the lower end of the percolator is narrowed and provided with a stop-cock, which, says Christison, "is sometimes advantageous;" while Fig. 11 shows the percolator arranged for pressure-percolation, mercury being poured into *a* when the operation is started at *b*, by opening the stop-cock *c*.

Percolator—Improved Dropper to Regulate the Flow.—Prof. Remington has devised the percolate dropper shown in the accompanying cut (Fig. 12), which is an improvement over the ordinary sprinkler-top arrangement recommended by him heretofore. By means of the new dropper the dropping is controlled with the utmost nicety, it being possible to time the drops very accurately. The improvements over the old sprinkler top are said to consist in the material being of pure block tin, and the valve-

seat being conical and longer than usual, and the cap being made much longer, so as to permit of its handling without soiling the fingers, and the aperture larger, so as to prevent any possible clogging.—Merck's Rep., April 1, 1897, 219.

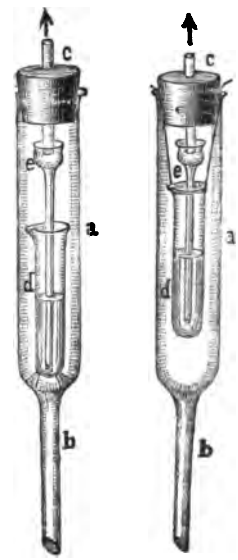
FIG. 12.



Percolator.

Extraction Apparatus — Modification of Hulsebosch's "Perforator."—Giulio

FIG. 13.



Extraction Apparatus.

Morpurgo describes the following method of constructing a modification of Van Ledden Hulsebosch's "perforator," by which this apparatus is very much simplified: A glass tube 20 Cm. long and 5 Cm. wide (*a*) is drawn out at one end into a funnel-shaped tube (*b*) about 10 Cm. long and 1 Cm. wide. The wider portion is closed with a stopper, through which passes a glass tube (*c*), the upper end of which is connected with a good back-flow condenser. Within the outer tube (*a*) is placed a test-tube (*d*) and a funnel tube (*e*). The accompanying cut (Fig. 13) the first formed devised by the author, in which the test-tube rests upon three glass supports, is shown on the left, while on the right is shown a later and preferable model, in which the test-tube is suspended from wires which hook over the edge of the outer tube.

The liquid to be treated is placed in the test-tube, the apparatus closed, and a sufficient quantity of the menstruum is poured through the tube *c*. The lower tube *b* is then inserted through the stopper of a flask containing

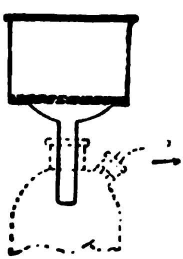
a supply of the menstruum to be used, and heat is applied by placing the flask in a water-bath. The menstruum evaporated from the bottom flask is cooled in the condenses and drops down through the tubes *c* and *e* to the bottom of the liquid in the tube *d*. Rising through this (the menstruum must always be of lower specific gravity than the liquid treated), the menstruum dissolves out the soluble portions of the liquid under examination, and overflowing the test-tube (*d*), carries the soluble portions down into the flask below.—Amer. Drug., June 10, 1897, 315.

CLARIFICATION.

Cellure Filters—An Inexpensive Substitute for the Pasteur Tube-Filters. —H. Potterin finds that the expensive and fragile biscuit porcelain tubes in the Pasteur and other filters may, with advantage, be replaced by filtering media prepared from cellulose. Fibres of the latter are finely powdered and sifted, then suspended in water so as to form a paste which, when slowly dried, forms plates some millimeters thick. These plates are very efficacious as filters, and are so inexpensive that it is a cheaper matter to replace them with new ones than it is to clean porcelain tubes.—Comp. rend., cxxiii., 263.

Suction Filter—New Form.—Dr. Ackermann has invented the suction filter shown by the accompanying cut (Fig. 14). It is made of porcelain,

FIG. 14.



Suction Filter.

FIG. 15.

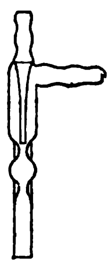
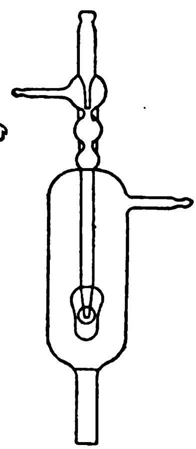


FIG. 16.



Filter Pump.

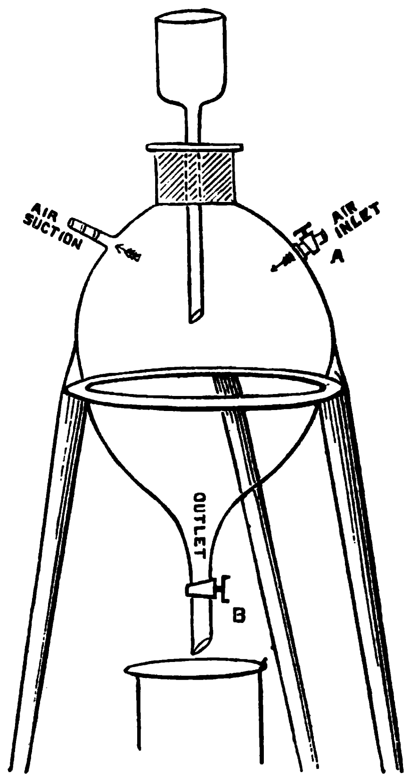
and has the advantage over similar filters in that the filter plate can be taken out and readily covered with a straining cloth, filter paper, or other filtering medium. The apparatus is attached to a suction flask by means of a perforated rubber stopper.—Pharm. Rev., June, 1897, 116.

Filter Pump—New Construction.—J. Wetzel has designed a new filter

pump which possesses some advantages over those of ordinary construction. In the new form the tube widens after the first constriction, and then narrows, as is shown in Fig. 15. The water thus twice exerts its action. The current must be so regulated that the bulb between the two constrictions does not become filled with water. Using water at 5° C., a vessel of 3 liter capacity was evacuated down to a pressure of 7 Mm. of mercury, in about one-third of the time and with the use of about one-third of the water required to produce the same effect with a pump of the old form. Fig. 16 shows the pump as constructed for the evacuation and delivery of compressed air.—Merck's Rep., June 15, 1897, 380; from Jour. Soc. Chem. Ind., xvi., 355.

Filter-pump Flask—New Construction.—W. Diamond recommends the filter-pump flask shown by the accompanying cut (Fig. 17) in place of the

FIG. 17.



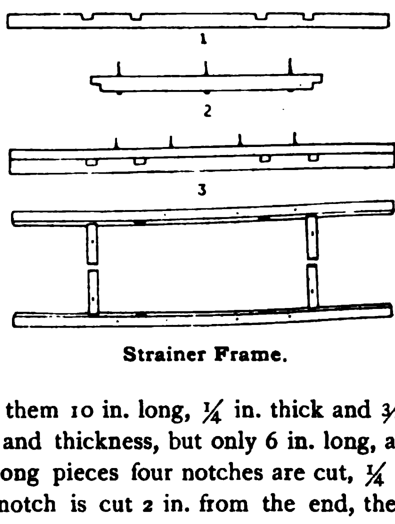
Filter-pump Flask.

one ordinarily in use, and finds it to save a lot of unnecessary work. Instead of the flask being flat-bottomed, it is made dome-shaped, and at the bottom there is a tap, *B*, which acts as an outlet. Close to the neck there

is another tap, *A*, which breaks the vacuum when turned on, the whole resting upon a tripod. As the filtrate accumulates in the flask the air tap, *A*, is turned on, thus allowing a current of air to enter and break the vacuum; then the outlet tap, *B*, may be turned on and the liquid withdrawn. When empty the taps are again turned off, and the apparatus is again in working order, the interruption being but slight and non-interfering with the precipitate or other contents of the filter.—Chem. News, Dec. 11, 1896, 283.

Strainer Frame—Simple Construction.—J. F. Hostelly gives the following directions for making an adjustable strainer frame: Four pieces of

FIG. 18.



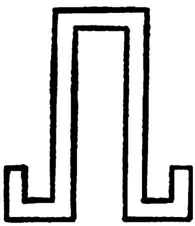
Strainer Frame.

hard wood, two of them 10 in. long, ¼ in. thick and ⅜ in. wide, and two of the same width and thickness, but only 6 in. long, are procured, and in the edges of the long pieces four notches are cut, ¼ in. wide and $\frac{3}{16}$ in. deep. The first notch is cut 2 in. from the end, the next, 1 in. further along, the next 3 in., and the last 1 in. in (as shown at *1*, Fig. 18). Then nail over the top of these a strip of wood 10 in. long and ¼ in. in thickness. Next cut across the narrow ends of each small piece a notch $\frac{3}{16}$ in. deep and extending ¼ in. back from end, as shown by *2*. Now drive thin wire nails through all four pieces, as shown by *2* and *3*, which are to hold the straining cloth in position while using. To adjust the frame the ends of the small pieces are slipped into the notches in the long ones, and regulated to any one of the three sizes by merely shifting to different notches.—Pharm. Era, Oct. 5, 1896, 494.

Siphon—New Type.—Dr. U. W. Massalski has designed a type of siphon which has for its purpose to obviate the disadvantage possessed by the ordinary type of siphon in that, as soon as the liquid enters the end of the shorter leg, air enters, the siphon empties, and must be refilled to be started again. The new siphon once started may be lifted from the liquid without emptying itself. At any desired moment it may be plunged

into the liquid to be moved, and it commences at once to act. Thanks to this property of remaining always ready, this type appears to be especially suitable for taking fluid from a reservoir into which the supply is coming irregularly, or when the reservoir allows the liquid to escape at a varying rate. The peculiarity of the siphon consists in the fact of having the legs terminated with two right-angles, as represented in the cut (Fig. 19). Once filled it may be lifted about, but still remains ready for use.—Merck's Rep., April 1, 1897, 219; from Montreal Pharm. Journ.

FIG. 19.



Siphon.

APPLICATION OF HEAT.

Bunsen Burner—Construction for Acetylene as Fuel.—A. E. Munby has successfully used acetylene as fuel in a Bunsen burner of special construction. In this burner the tube is five millimeters in diameter, but a slightly wider tube may be used, provided the mouth be curved inwards, so that the actual exit does not exceed the diameter mentioned; if larger, the flame tends to strike down. The gas jet is very small, being only capable of delivering about one cubic foot of acetylene per hour under six inches water pressure, such a rate of consumption giving an ordinary working flame. The air-holes and collar are arranged as in an ordinary Bunsen, the exact size of the holes not being of much importance, provided they be large enough to admit the air required. The burner is protected with a cap, when not in use, as its efficiency depends upon the jet maintaining its dimensions. A generator capable of giving gas under seven inches water pressure with the full number of burners in use is required. Under this pressure a large, perfectly blue flame is obtained, which may be turned down to what may be termed a quarter Bunsen flame, equivalent to burning the gas under three to four inches water pressure. This is the smallest pressure with which the burner will give a non-luminous flame; when turned lower, the zone of partial combustion appears, since the draught is then insufficient. The heating effect of the flame is, of course, very great, enabling one to dispense with the blow-pipe for such operations as small fusions. From a few experiments on heating equal quantities of water under like conditions with coal gas and acetylene, it would seem that in practice, for equal volumes burnt, the latter has nearly twice the heating power.—Pharm. Jour., May 29, 1897, 469; from Proc. Chem. Soc.

Bunsen Burner—Protector.—Max Kaehler and Martini, Berlin, construct a protector for the Bunsen burner (see Fig. 20) which, similar to Davy's safety lamp, is a cylinder of fine gauze, held together by means of a metal ring. The lower end of this cylinder is closed by a metal floor which is bent trumpet-shaped like the mouth-piece of the blow-pipe. It is furnished with several slits, so that it will fit burners with tubes of different

diameters. The upper end of the cylinder is covered with a round piece of the same gauze. With the aid of this protective cap it is possible to heat ethereal or alcoholic liquids directly without danger of ignition, a matter of some importance to the organic chemist, who frequently has

FIG. 20.

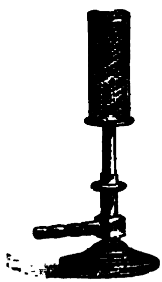


FIG. 21.

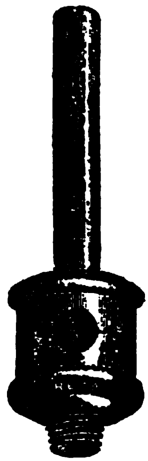
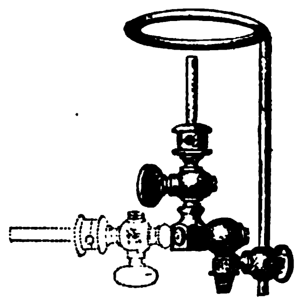


FIG. 22.



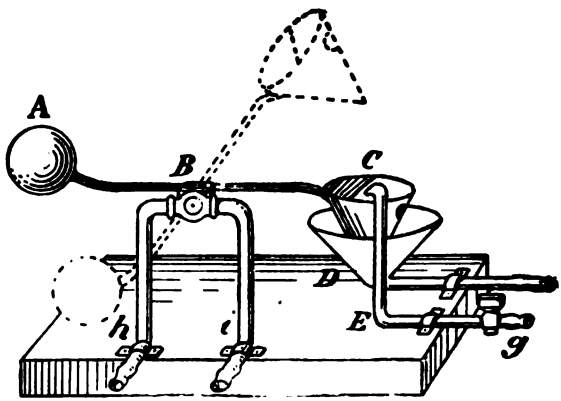
occasion to dissolve small quantities of substances in ether, alcohol, benzene, etc., and, on account of their inflammability, has to resort to the water bath, with loss of time.—Pharm. Rev., Jan., 1897, 13.

Atmospheric Gas Jet—A Simple Application of the Bunsen Burner.—C. Thomson has devised a useful burner on the principle of the Bunsen burner, which has proved a great success, and is obtainable at a small cost in the English market. It is shown in the accompanying cut (Fig. 21) in exact size, and will fit any ordinary gas-burner socket. On excluding air, an ordinary illuminating flame is obtained; a partial supply of air produces a Bunsen flame, and a full supply of air gives a powerful blow-pipe flame, useful for soldering, brazing, igniting precipitates, or melting refractory substances. The cut shown by Fig. 22 represents the jet fitted with a tap, swivel, and ring-support, together with a taper thread for fitting into existing fixtures.—Pharm. Journ., Sept. 12, 1896, 245.

Automatic Stop-cock for Gas—Useful Construction.—Dr. Hugo Michaelis has invented an automatic gas stop-cock, shown by Fig. 23, which is applicable wherever a simultaneous supply of water and gas is derived, as in constant level water baths, or in heating a vessel with reflux condenser. The apparatus works as follows: The tube *g* is attached to a faucet close to the one which connects with the water-bath or condenser; or still better, to the same faucet by means of a T-tube. The water flows through *g* into the funnel *C*, which has an orifice at the bottom to let out the water, but

always less than flows in. The excess flows into the exit-funnel *D*. Funnel *C* is attached to one arm of a lever, which is fastened to the gas cock *B*, while at the other end of the lever is situated the counterpoise *A*.

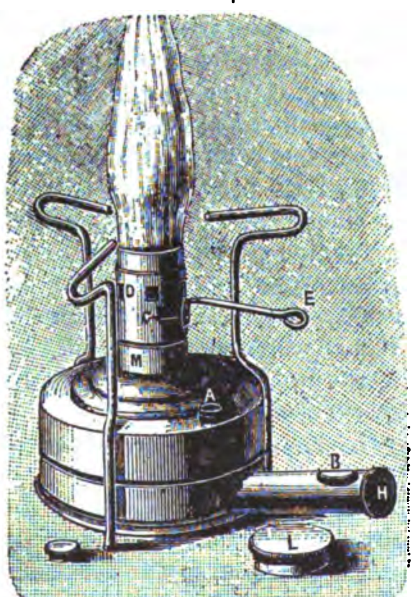
FIG. 23.



Automatic Stopcock for Gas.

As long as *C* is filled with water—that is, as long as water is running—the lever is in a horizontal position and the gas-cock is open. As soon as the water supply ceases, the funnel is gradually emptied until the weight *A* moves the lever into the position indicated by the dotted lines; hereby the gas-cock is closed, and the flame is extinguished. The apparatus being entirely automatic, an experiment can be carried on without any attention.—Pharm. Rev., June, 1897, 117.

FIG. 24.



Alcohol Lamp.

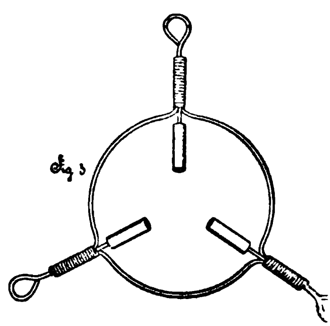
Alcohol Lamp—Novel Construction.—Bar, of Paris, constructs the lamp shown by Fig. 24, which is remarkable, inasmuch as it burns alcohol together with steam. It consists of a copper vessel, which is filled with alcohol through the opening *A*. At the lower point is an inclined tube provided with an opening *B*, into which a small quantity of water is passed, which communicates with the central tube.

At the center is a cylindrical tube *M*, which bears a wick at the level of the orifice *C*. Over this tube is a sleeve provided with the orifices *C* and *D*. The flame is regulated by opening or closing the openings *B* and *D*, the latter by means of the pin *E*. *B* is opened or closed by means of the screw *H*. By these means tbe quantity of air admitted to the flame is controlled, and consequently its intensity. In order to start the lamp, it is only necessary to light the wick at *C*. To extinguish it, the openings *B*, *C* and *D* are closed, and the cover *L* is placed over the tube.—Merck's Rep., June 1, 1897, 348; from La Nature.

Asbestos Lamp Wicks—Manufacture, etc.—According to a patented process, asbestos lamp wicks are made by mixing together asbestos flour and wood flour, moulding the mixture, and subjecting it to combustion at 1000° C. The advantages of asbestos wicks are evident; they are not consumed or carbonized, produce a cleaner and more intense light, and economize at least 20 per cent. The wick, however, requires a specially constructed burner, and especially refined petroleum oil.—Pharm. Centralh., Aug. 6, 1896, 516; from Bayer. Ind. u. Gew. Bl., 1896.

Crucible Holder—Adjustable Form—Max Kaehler and Martini, of Berlin, manufacture the crucible holder shown by Fig. 25, in which the crucible hangs in the space between three clay rods, which are fastened to wires. These wires can be moved back and forward so that the circle of space between the points can be changed from 3 to 5 cm. in diameter, and so furnishes room for crucibles of different sizes.—Pharm. Rev., June, 1897, 116.

FIG. 25.



Crucible Holder.

Evaporation—Use of Steam Coils.—C. J. H. Warden makes some practical remarks on the use of steam coils in evaporating vegetable solutions. These, when employed, are usually placed on the bottom of the evaporating vessel. He thinks, however, that the position should be reversed, and that copper coils, if necessary coated with tin or even plated with silver, gold or platinum, should be suspended near the surface of evaporating liquids holding vegetable matter in solution. The coil might be attached to the steam-cock by means of a Royle's patent swivel union, by means of which it could be raised or lowered in the fluid during concentration. The advantages of this position of the coil would be that, as the liquid becomes more concentrated on the surface, there would be a tendency of it to sink to the bottom of the vessel, and would then be removed from the area of high temperature; and that it would be possible to boil the liquid on the

surface, while that beneath would indicate little or no rise in temperature. The liquid at the bottom would eventually necessarily become heated, but prolonged heating of a large portion of it would be clearly avoided. Indeed, it might be practicable to prevent undue heating of the lower stratum of fluid by allowing the vessel to stand in cold water up to a certain height. —Pharm. Jour., April 10, 1897, 307.

Drying Box—Convenient Construction.—Thomas S. Wiegand calls attention to a convenient drying box, which is inexpensive and serves a good purpose for drying hygroscopic lozenges, roots and herbs, salts, etc. It consists of a box made of good sound wood, free from loose knots or cracks, planed smoothly, so that the close-fitting joints and the inside may be covered with paper pasted on; the lid should fit tightly and the edges of the box should be lipped with soft leather or sheet rubber. A tray must be provided, in which freshly burnt lime is to be placed, and upon the sides of the box cleats are fastened at convenient distance to support wire frames, upon which the substances to be dried are placed. The lid should admit of being fastened very tightly by means of hooks.—Amer. Journ. Phar., Dec., 1896, 666–667.

Drying Box—Construction for Drying Pills, etc.—C. J. H. Warden also describes a drying box, which he had used in the Bengal Medical Store Depot with considerable advantage, particularly for drying pills; the air in Calcutta being for many months in the year so saturated with moisture that drying in the open air became a matter of great difficulty. A teak-wood box was lined with tin, and fitted with two lids, the inner one being coated along its sides with felt, and resting on ledges similarly fitted, like the inner lid of an ice-chest. A movable tin tray, containing about 25 pounds of well-burned lime in small pieces was placed in the bottom of the box, the substance to be dried being placed in perforated zinc trays, supported by buttons above the lime. Such a drying box is particularly advantageous for drying pills containing volatile oils, which would be partially vaporized if exposed to a current of warm air.—Pharm. Journ., March 20, 1897, 245.

FIG. 26.

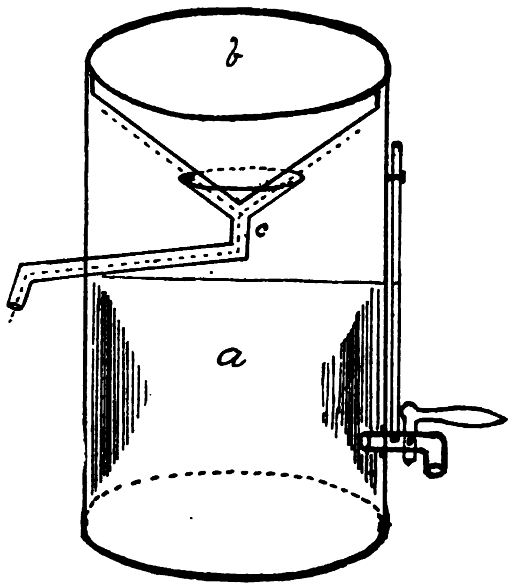
Steam Bath.

Steam Bath—Novel Construction.—Franz Hering manufactures the small steam bath shown by Fig. 26, which appears to be admirably suited for heating infusion pots and other small pharmaceutical operations. It is claimed that with an ordinary Bunsen burner it yields steam within half a minute. The large brass ring shown in this illustration is hollow, and filled with water. The central cylinder is arranged to contain only a small quantity of water,

which is therefore rapidly heated, the level being maintained from the supply in the reservoir.—Pharm. Jour., Jan. 23, 1897, 74.

Water Still—Simple and Practical Construction.—W. T. Cummings has devised a simple and practical water still which is shown by Fig. 27, and which is intended simply as a suggestion, subject to further improvement or elaboration. The cylindrical container *(a)* is put in place over the gas or other burner. A conical shaped tin *(b)* is placed in the upper

FIG. 27.

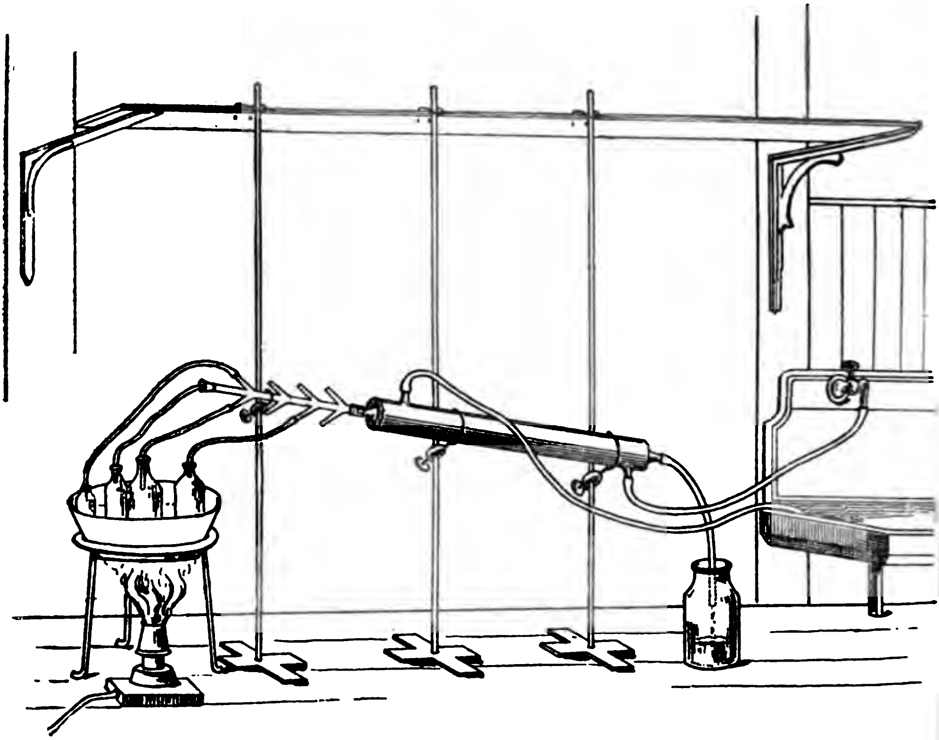


Water Still.

part and filled with cracked ice. As the water becomes heated, the steam condenses upon the walls of the conical tin and is caught in the conducting pipe *(c)*, which conveys it to a suitable receiver. A faucet for withdrawing hot water, and a gauge for observing the height of water may also be provided.—Merck's Rep., April 15, 1897, 240.

"Gang" Still—A Novel Arrangement.—C. W. Addison describes the "gang" still shown in the accompanying cut (Fig. 28), which he devised in order to overcome one of the difficulties in manufacturing fluid extracts in small quantities—the recovery of alcohol. The "gang" part is formed by attaching to a Liebig condenser a tube 7 or 8 inches long, from which branch out a number of small tubes, slightly tapering, and made to fit ⅛ inch rubber tubing. Bottles containing different preparations from which it is desired to recover alcohol are labeled by a tag tied to the neck, placed in a water bath and connected with branches of the tube leading to the

FIG. 28.



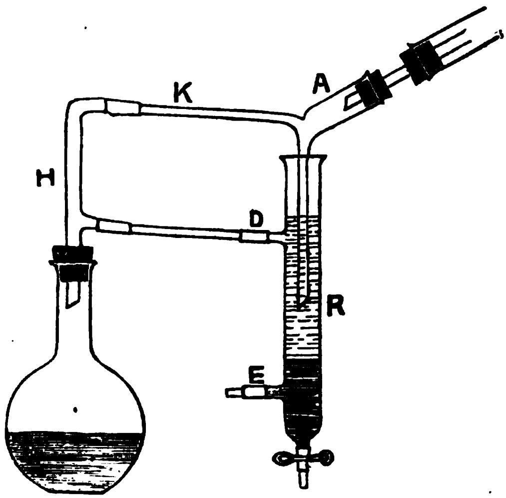
"Gang" Still.

condenser. By proper care in assorting the different lots of extracts, different lots of distillates are obtained, which are useful for different purposes.—Drug. Circ., Feb. 1897, 45.

Distillatory Apparatus—Modification.—In using the apparatus described by Matthews (Jour. Chem. Soc., lxxxi, 318), it occurred to Wm. Cormack that by a slight modification of the structure and arrangement of the parts, a gain both in point of simplicity and freedom of construction might be secured. The modified apparatus, shown by Fig. 29, consists of a head-piece, *H*, an adapter, *A*, and a receiver, *R*. The head-piece, which resembles that of a Drechsel extraction apparatus, is fitted into the neck of the flask by means of a cork or rubber tubing. The vapors from the flask pass along the tube *K* to the condenser through the adapter, *A*, which is an ordinary bent adapter with a short tube sealed on at the bend. After condensation, the liquid runs down the vertical tube of the adapter into the receiver, *R*. As shown in the figure, the apparatus is set up so as to collect a liquid which is heavier than water. In this case the liquid sinks to the bottom of the receiver and the water floats on the top. As soon as

the level of the water has attained a certain height it flows back through the upper side-tube, *D*, into the flask. It is essential that *D* should be at a lower level than the lower side-tube of *H*. The receiver is drawn out at the bottom and furnished with a rubber tube, clip, and jet, so that it may act at the same time as a separator. The lower side-tube, *E*, of the receiver is closed by a cap of rubber and glass rod. If the liquid to be col-

FIG. 29.



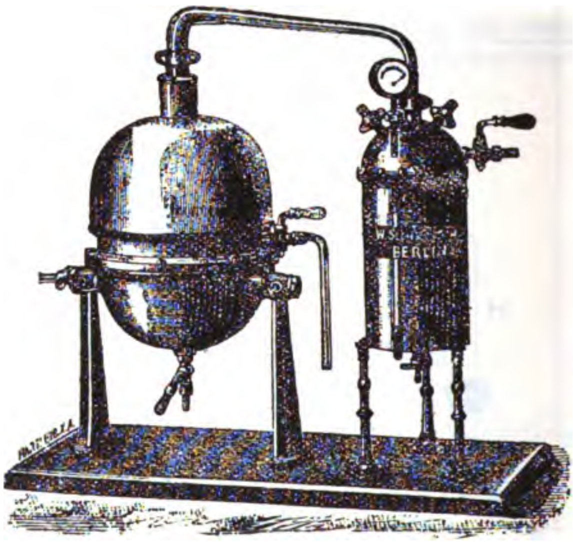
Distilling Apparatus.

lected is lighter than water, the upper tube, *D*, is closed by the cap, and connection made by glass and rubber tubing between the lower tube, *E*, and the head-piece. The water then sinks to the bottom and flows back into the flask through the lower tube and its connections.—Chem. News, June 11, 1897, 279.

Vacuum Still—Construction for Small Operations.—The vacuum still shown by Fig. 30 is manufactured by Schwarzman (Berlin), for use with either steam or hot-water, and recommends itself for operations in pharmaceutical laboratories of moderate size. It consists of a jacketed copper pan fitted with a nearly hemispherical glass head from which a beak leads to the condenser. The glass head rests on a rubber ring sunk in the rim of the jacketed pan, and is firmly held there by atmospheric pressure as soon as a partial vacuum has been effected. The condenser is constructed so as to save the distillate, or to run it to waste. The vacuum is produced by means of a water-jet vacuum pump which can be supplied with the apparatus. If desired, a porcelain dish fitting into the copper pan can be supplied, so that the distillation of liquids attacking copper can be effected without injury to the pan.—Pharm. Journ., Oct. 24, 1896, 374.

Automatic Stills—Improved Construction.—F. E. Mathews at a meeting of the Chemical Society described two pieces of apparatus which were

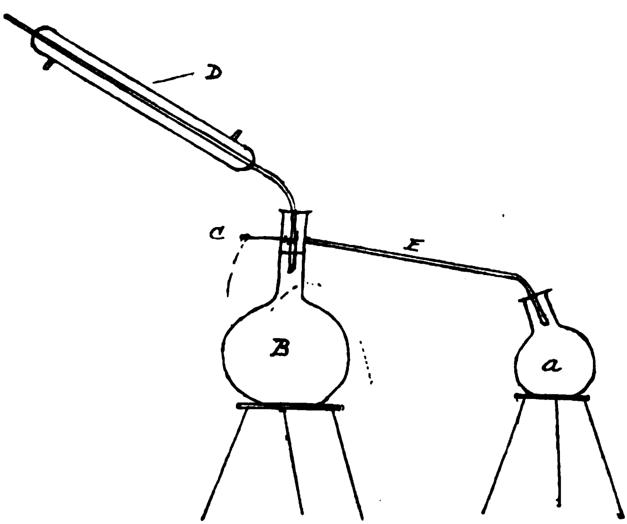
FIG. 30.



Vacuum Still.

practically automatic, one for the distillation of liquids heavier than water, the other for liquids lighter than water. The accompanying cuts, Figs. 31

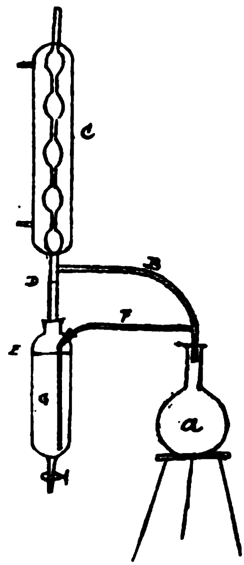
FIG. 31.



Automatic Still.

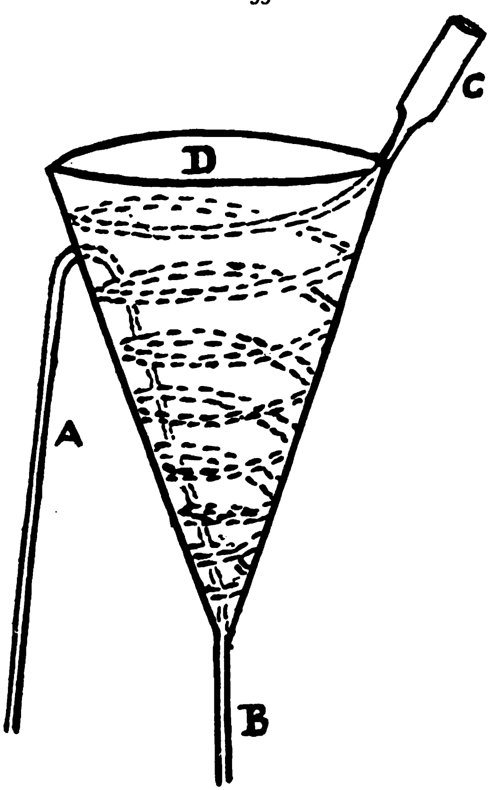
and 32, will explain the action of the ingenious apparatus. In Fig. 31, for liquids *heavier* than water, *A* contains water and the liquid to be distilled. The steam and volatile liquid pass into the aperture marked *C*, and both condense in *D* and drop into *B*, nearly filled with water. As the volatile body collects in *B*, the surplus water runs back through *E* into *A*, and this goes on continuously as long as it is necessary to keep up the distillation. In Fig. 32, for liquids *lighter* than water, *A* contains the liquid to be distilled. The vapor passes through *B* into the condenser *C*, collects on the surface of the water in *G*, and drives the latter back through the tube *F* into *A*—*D* and *E* showing the amount of light liquid collected.—Pharm. Jour., Feb. 13, 1897, 134.

FIG. 32.



Automatic Still.

FIG. 33.



Upward and Downward Condenser.

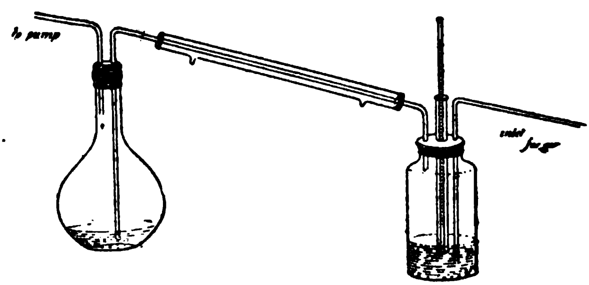
Upward and Downward Condenser—Simple Construction for use with Ice.—C. H. Southwell describes the condenser shown in the accompanying cut (Fig. 33). The condensing worm commences at *C* and terminates at *B*, forming a spiral round the interior of the funnel-shaped copper vessel D, which is filled with broken ice. As the ice melts the water accumulates until it reaches the bend in the siphon *A*, when it runs off, leaving the ice. The application of the condenser is obvious. When well supplied with ice, in extraction with ether, for example, by the

"Soxhlet" apparatus, no escape of ether takes place.—Chem. and Drug., Aug. 21, 1896, 317.

Aluminum Condensers—Advantages.—T. H. Norton describes a condenser consisting of an aluminum tube with an outer tube of glass. The arrangement is such that the condensing vapors do not come in contact with any substance but the metal, the high conductive power of which permits very rapid distillation of such liquids as alcohol, benzene, nitrobenzene, ether, acetone and chloroform, and there is practically no attack upon the metal. These qualities of aluminum make it also superior to glass or tin in connection with the distillation of water.—Journ. Amer. Chem. Soc., 1897, 153.

Low Temperatures—Simple Method of Production.—C. Edward Sage recommends the following simple method and apparatus (see Fig. 34) for reducing the temperature of liquids in a very short time: A six-ounce,

FIG. 34.



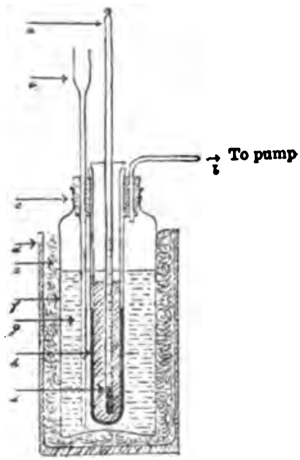
Low Temperature Apparatus.

wide-mouthed bottle is fitted with a good cork, which is pierced with three holes, one to admit a test-tube; the others for admitting two glass tubes. The inlet tube (for air) passes to the bottom of the bottle, the exit tube only a short distance through the cork. The bottle is partly filled with ether, and the sample to be examined is placed in the test-tube together with a thermometer. Air is now forced into the bottle by the inlet tube, or it may be pumped through the ether by attaching a Sprengel pump to the exit tube, whereby rapid evaporation takes place and reduction of temperature is effected. To prevent the waste of ether a condenser and wash flask may be intervened between the freezing bottle and the Sprengel pump. Most of the ether is thus condensed and returns to the bottle, the remainder being absorbed by cold water in the wash bottle, and from this recovered by gently heating. The author explains that he has found no difficulty in maintaining a temperature of —4° to —5° C. for a long period during the hottest weather.—Pharm. Journ., Nov. 7, 1896, 397.

Another cheap and practical apparatus for obtaining low temperatures is described by S. J. Lewis, and is considered by him to be an improvement

over that of Mr. Sage. It is shown by Fig. 35. The freezing bottle—a 1 oz. quinine bottle—is placed in a 16 oz. open pot, and the interspace packed with tow to form a non-conductor of heat. It is fitted air-tight with a cork, or, better, a rubber stopper, through which a funnel tube passes to near the bottom for the supply of the liquid freezing agent. An outlet tube passes to the pump, the most convenient being an aspirating filter-pump worked by means of the water supply. A strong test tube passes through the center of the stopper to near the bottom of the freezing bottle, a little mercury being placed in it. The substance to be treated is put into a second test tube, which is then placed inside the first, the mercury thereby rising and forming a conducting lining between the two tubes—the inner tube being kept down, if necessary, by a twist of copper wire passing over its mouth and around the neck of the freezing bottle. The latter is filled to three-fourths of its capacity with ether meth. .720,

FIG. 35.



Low Temperature Apparatus.

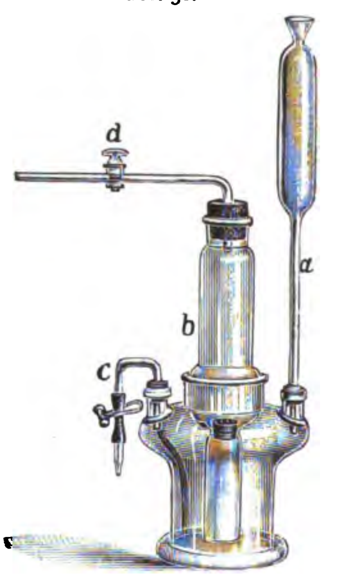
or with liq. ammonia .880—the latter being the cheapest and readily maintaining a temp. of —10° C. for 1½ to 2 hours before it becomes reduced too far in strength. With the ether a lower temperature may be attained (—21° C.), and it may be prolonged indefinitely by re-supplying it through the funnel (or inlet) tube. The current of air should be continuous and fairly strong throughout the experiment.—Chem. and Drugg., Jan. 2, 1897, 17.

MISCELLANEOUS APPLIANCES.

Gas Generator—Improved Construction.—Max Kaehler & Martini, of Berlin, manufacture the gas generator shown by Fig. 36, a device of Barge which promises the advantage over those of ordinary construction in that the materials—for instance calcium carbonate and hydrochloric acid—are consumed without contamination of the unconsumed acid by the resultant calcium chloride solution. The apparatus consists of a thrice-tubulated supply flask. Into the large middle tubule a glass-ground cylinder *b* is fitted and reaches nearly to the bottom of the flask. This cylinder is charged with the material from which the gas is to be generated—$CaCO_3$, FeS, Zn, etc.—this material being supported at about the height of the middle tubule by a rubber stopper with several perforations inserted in the contracted part of the cylinder at this point. One of the smaller side tubules supports a pressure tube with bulb and funnel. Into the other a bent tube *c* is inserted, which acts as a siphon, one arm

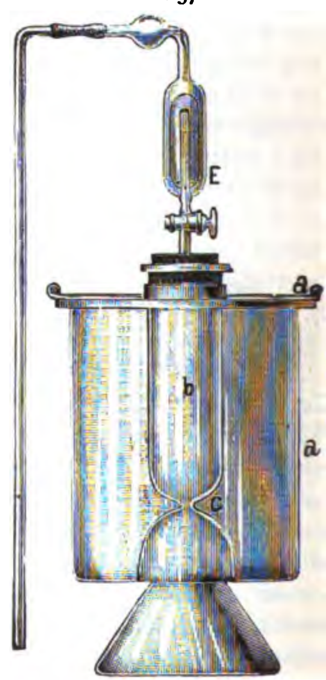
reaching to the bottom of the reservoir, while to the other is attached a piece of rubber tubing closed by means of a pinch-cock. The mouth of the cylinder *b* is provided with a perforated rubber stopper into which a glass tube with stop-cock is inserted, the generation of the gas being regulated by opening or closing this stop-cock. In order to place the apparatus in working order, cylinder *b* is filled with the necessary material, the stopper bearing the bent tube is inserted and the stop-cock is opened. Acid is then poured into *a* until it covers the opening in cylinder *b*, thereby starting the generation of gas. The stopcock is closed and more acid is added until about one-fourth of the cylindrical part of *a* is filled. The flow of gas is produced by simply opening the stop-cock *d*. The salt formed—chloride of calcium for instance—sinks to the bottom of the reservoir. Fresh acid enters from above through the small opening without coming in contact with the reserve acid, and in this way all of the acid can be utilized. If in the course of time the apparatus has been filled with salt solution, it can be drawn off through *c*.—Pharm. Rev., Jan., 1897, 13.

FIG. 36.



Gas Generator.

FIG. 37.



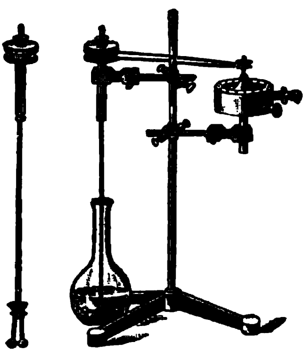
Gas Generator.

Gas Generator—New Construction.—Dr. Voeller has invented the apparatus shown by Fig. 37, which serves for the generation of Cl, H, SO_2, H_2S, CO_2, etc. It consists of a cylindrical glass vessel, *a*, of about 3 liters

capacity, whose lower end is contracted and again widened so as to assume the shape of a Scheibler's desiccator. This vessel holds the acid. The substance to be acted upon by the acid is placed in another cylinder, *b*, of about 700 Cc. capacity, which is also drawn in near the bottom, as shown at *c*, to about 2.5 Cm., and then widens into an open bell 5 Cm. high and 8 Cm. wide. The opening at *c* is either closed with a perforated stopper or covered with broken glass to prevent the falling of any of the substance into the acid. The upper opening of the cylinder is closed with a ruhber stopper, through which passes the exit-tube. Upon opening the stop-cock the acid rapidly rises into the cylinder, but can be so regulated as to attack only the lower portions of the material in the cylinder. The resulting salt solution, being heavier, sinks and fills the space—or well—beneath the cylinder. Upon closing the stop-cock the acid is forced back, and the subsequently developed gas fills the bell-shaped extremity of the cylinder. The exit-tube can be directly connected with a gas-washing apparatus, as shown in the figure at *E*. The apparatus is supplied by Max Kaehler and Martini, Berlin.—Pharm. Rev., June, 1897, 117.

Stirring Apparatus—Novel Construction.—Hermann Schultze has invented a new stirring apparatus which is placed on the market by C. Gerhardt, Bonn, Germany. As shown by Fig. 38, it consists of a glass rod, which can be readily rotated in the usual manner, and on whose lower end two hollow glass balls are so fastened by means of heavy platinum-iridium wire as to be movable. Ordinarily these hang vertically, but upon immersion into liquids they are buoyed up into a horizontal position. The stirrer possesses several important advantages, and is remarkably efficient. Using it in connection with a Rabe's turbine with 3.5 atmospheres of water pressure, 1.5 liters water and 200 grammes benzol were so thoroughly emulsified that even after six hours' standing complete separation had not taken place, while with the use of other stirrers, under like conditions, the liquid became clear in 5 to 15 minutes. The stirrer is supplied of a length of 40 Cm., but can be furnished of any length desired.—Pharm. Rev., June, 1897, 116.

FIG. 38.



Stirring Apparatus.

FIG. 39.

Hand Drill.

Hand Drill—Application to Pill-Coating, Emulsionizing, etc.—" D " recommends the American hand drill, to which an attachment for holding pills may be affixed as shown by Fig. 39, as useful for coating pills. It may be used with great convenience also for stirring

emulsions, to burnish capsule moulds, to drive an air fan, and to accomplish many objects that require rotation at a high speed.—Pharm. Journ., Sept. 12, 1896, 247.

Rubber Tubing—Action of Coal-Gas.—Grosheintz has investigated the action of coal-gas upon rubber with the following results: Connecting a pressure-gauge to a gas supply by a rubber tube, it was found that 12 hours after the closing of the stop-cock the pressure had not only disappeared, but an actual defect of pressure was indicated. The rubber had gained in weight from absorption of the gas. Further research showed that black rubber, with ½ to 1½ per cent. of added solids, absorbed the gas the most readily; red rubber, with 10 or 12 per cent., coming next; while the ordinary gray rubber, containing 52 to 55 per cent. of foreign material, was least affected. This gray rubber proved its superiority as a retainer by being the last to be so permeated by the gas as to yield a smell in the room. —Merck's Rep., June 15, 1897, 381; from "Invention."

Rubber Implements, etc.—Method of Softening.—S. H. Hill states that he has occasionally softened rubber by letting it remain in benzine a short while.—Proc. Penna. Pharm. Assoc., 1896, 121.

Bottles.—Rapid Method of Drying.—The following rapid and simple method of drying bottles before filling them with powders or oils, etc., is given in "Pharm. Journ." (Sept. 12, 1896, 220): Introduce an ounce or so of white mustard seeds, and rotate briskly; the seeds will absorb every trace of adhering moisture, and leave the bottle perfectly dry. The method has been in use for many years in some large establishments, and deserves to be more widely known on account of its convenience and efficiency.

FIG. 40.

Poison Bottle.

Poison Bottle—Novel Shape.—Henry Lemmermann has devised the poison bottle shown by Fig. 40. The bent neck of the bottle is the device that seems calculated to insure security, since this peculiarity is sufficient to arrest the attention of even the most absent-minded person.—Amer. Drug., Feb. 10, 1897, 91.

Prescription File and Check-Blank—A Form Calculated to Secure Greater Accuracy.—Prof. Edward Kremers observes that errors in the compounding of prescriptions will, no doubt, always occur. It should be possible, however, to lessen the number of errors materially, and with this object in view he makes some suggestions with regard to the filing and compounding of prescriptions, which ought not only to result in greater accuracy and safety, but which may lend to the act that air of care and importance which will impress the customer with confidence. He proposes a full-page blank form for each prescription—shown in connection with his paper—to which reference must be had. This blank is divided into two portions, that to the left being the smaller, and accommodat-

ing an ordinary prescription blank in a blank space provided. Immediately upon receipt, the physician's prescription is pasted on this left side, and receives its number. Nothing more is done to the prescription as such, which remains untampered documentary evidence if necessary. If the prescription contains an incompatibility, the correction of which lies within the domain of the pharmacist, attention is called to such incompatibility and the mode of correction noted in a space provided for that purpose immediately beneath the prescription. Any changes in the prescription to enable it to be compounded *lege artis* should also be noted. On the larger portion of the blank, to the right, there is space for an *unabbreviated* copy which should be made by the clerk as documentary evidence of how he read the prescription. At the same time he computes the doses in space indicated on this side of the blank and compares these with the maximum doses, which are also recorded. There are spaces for recording the following memoranda:

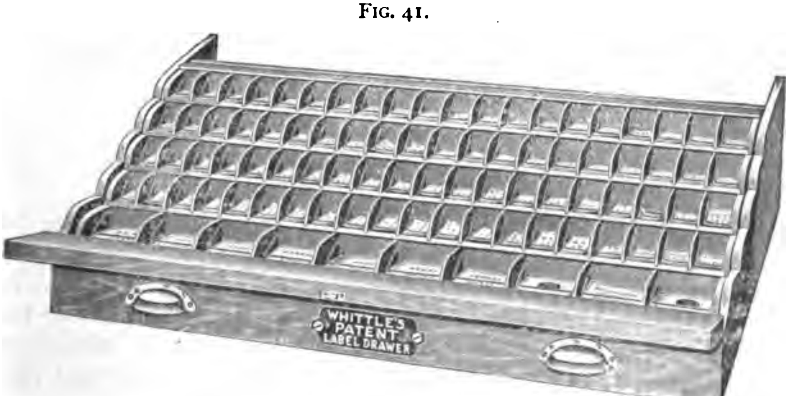
On the left side of the blank.—For whom; age of patient; date of and hour of receipt; by whom received; when to be called for; space for original prescription; space for remarks on prescription.

On the right side of the blank.—Number of prescription; by whom compounded; by whom delivered; remarks concerning delivery; price; space for unabbreviated copy and remarks as to doses prescribed and maximum doses; by whom copied and computed; by whom checked; space for remarks on compounding of prescription.

Prof. Kremers observes that such blanks, which may be bound in folios of 250 to 500, will not alone serve well when there is occasion to have the prescription recorded on them refilled after months or years, but in the courts it would impress both judge and jury with the painstaking care with which the prescription was compounded.—Pharm. Rev., March, 1897, 47–49.

Label Drawer—Practical Construction.—Charles P. Whittle, Boston,

FIG. 41.



Label Drawer.

has devised the label drawer shown by the accompanying cut (Fig. 41). It is so constructed that the labels are arranged in tiers, so that any desired one may be removed without disturbing any of the others, all of which are kept in place by springs. Half of the front of the drawer falls down so as to give unimpeded access to the tiers of labels.—Amer. Drug., Feb. 10, 1897, 97.

Radiography—A New Field for Pharmacists.—Leo Atkinson, in a paper read before the British Pharmaceutical Conference, remarks that for the successful practice of radiography the pharmacist has special advantages in knowledge, training and general environment. A more extended acquaintance with physics and chemistry is required from the pharmaceutical than the medical student; the latter, after qualification, rarely extending their information on these subjects, while these very subjects form no mean part of the chemist's daily requirements. The author gives a brief sketch of the origin and application of "X-ray" photography, and points out the discoveries that have been made by its means, the apparatus that are necessary for the successful practice of radiography, etc. The earliest radiographic work appeared to indicate that at best only shadows of dense objects were likely to be obtained; but this view is proved to be erroneous, for the "X-rays" have been found to have properties in common with ordinary light, with regard to their action on the sensitive salts of silver. The finest gradations of leaf venation can be defined, as well as the cancellous structure of the thickest bone, the resulting picture depending on the ascertained relationship of exposure to opacity. The utility of the Röntgen photography to the detection of sophistication of foods and drugs is also referred to, together with other discoveries that have reduced the exposures to one-tenth, while the definition has been improved tenfold.—Yearbook of Pharm., 1896, 286–290.

To pharmacists interested in this subject a series of papers on "Practical Radiography," which have appeared in several numbers of the "Pharm. Journal," beginning with Dec. 19, 1896, will be of special value. The entire field is gone over very thoroughly, and the text is illustrated by numerous cuts.

B. PREPARATIONS.

GENERAL SUBJECTS.

Pharmaceutical Preparations—Preservatives.—William Martindale contributes an interesting paper on the preservatives of pharmaceutical preparations, in which he discusses their usefulness and application from the purely pharmaceutical standpoint and not on account of their having bacteriological importance. The preservatives considered are: alcohol, glycerin, acetic acid, sugar, salicylic acid, sulphurous acid, boric acid, camphor water, chloroform, chloral hydrate, carbolic acid, cherry laurel water, formaldehyde, hypophosphorous acid, carbonic acid, benzoic acid, soft

paraffin, aromatic waters, and essential oils, and, in their application, also heat and cold. The paper cannot be profitably condensed, and the subjects considered are therefore simply enumerated so that they may be conveniently referred to in the original paper, in Pharm. Jour., March 13, 1897, 230.

U. S. P. Preparations—Specific Gravities.—F. Dietze has calculated the specific gravities at different temperatures (from 15° to 30° C.) of a large number of preparations official in the United States Pharmacopœia, and communicated his results in the form of a table to Pharm. Rev. (Febr., 1897, 24). The preparations embraced by the table are the official acids, ether, alcohol, solutions, volatile and fixed oils, etc.

AQUÆ.

Aromatic Waters—Process Securing Stability.—Frank Edel, having his attention called to the advantage of using an excess of oil in preparing aromatic waters, has made experiments, and finds that when the waters are distilled with an excess of oil—peppermint, cinnamon, etc.—or camphor, and the excess allowed to remain in the distillate, the water will keep sweet and prime—in his experience, for over ten years. It is, however, necessary to draw off the clear water by means of a siphon when it is to be dispensed.—West. Drug., Nov., 1896, 487.

Chlorine Water—Extemporaneous Formula.—The preparation of chlorine water by the action of sulphuric acid upon sodium chloride in the presence of minium or litharge, with the requisite amount of water, results in an extemporaneous product to which the objection may be made that it contains sodium sulphate. Griggs, therefore, suggests the use of oxalic acid in place of sulphuric and calcium chloride in place of sodium chloride. The reaction taking place according to the following formula, $2C_2H_2O_4 + PbO_2 + CaCl_2 = C_2O_4Ca + C_2O_4Pb + 2H_2O + 2Cl$, the resulting chlorine water is free from solid impurities, the resulting calcium and lead oxalates being insoluble in water.—Pharm. Rev., March, 1897, 54; from Bull. Chim. farmac., 1896.

Referring to the above formula for the extemporaneous preparation of chlorine water, Dr. F. B. Power points out that both the method proposed by Griggs and the original method embody peculiar errors which are likely to render them useless for the purpose intended. The statement that chlorine water can be extemporized by the action of sulphuric acid on sodium chloride in the presence of minium or litharge is only partly correct, for although chlorine could be developed by the use of minium, Pb_3O_4, it could naturally not be developed by the use of litharge, PbO. It is, however, the modification of Griggs' which is of particular interest. It was evidently assumed by him that in this reaction oxalic acid performs the same function as sulphuric acid, but this is by no means the case. If the ingredients proposed are triturated together in a dry mortar, using

minium, not litharge, and the requisite amount of water is added, very vigorous reaction at once ensues, and a peculiar odor is developed, which is not that of chlorine but that of ozone. In an experiment made, the author found that the barium chloride remained for the most part undecomposed—to the amount of 90 per cent.—while the greater part of the oxalic acid had been oxidized to carbon dioxide and water.—Pharm. Rev., June, 1897, 108.

Chloroform Water—Stability.—Peter Boa, in view of the statement that the B. P. chloroform water does not keep well, has made some experiments which seem to prove that it keeps fairly well when made according to the official directions (15 minims of chloroform to 6¼ fluid ounces of distilled water.) It was opened weekly during six months, and monthly thereafter for twenty-one months more, and retained its taste fairly well to the end of that time, but showed slight acidity, and gave a cloudy reaction with silver nitrate. Two other samples, the one made with the addition of 2 drachms of rectified spirit, the other with an equivalent quantity of spirit of chloroform, had under the same conditions lost their characteristic flavor, but gave only a faint haze of cloudiness with silver nitrate.—Pharm. Jour., Jan. 23, 1897, 75.

Rose Water—Preparation.—William C. Alpers calls attention to the insufficiency of the pharmacopœial definition of rose water, and recommends its preparation from the oil, the purity of which can be easily ascertained by the pharmacopœial methods. About 10 drops of the oil, dropped at a temperature of about 80° F. (or 27° C.), appears to be about the right quantity for 1 liter of rose water, which may be made either by dropping the oil first upon filter paper, and then shaking with hot distilled water and filtering, or by dropping direct into hot distilled water and, after sufficient agitation, filtering. In the author's opinion, the water obtained by this method is superior to the distilled rose water obtainable in the market, though perhaps not superior to such as might be obtainable under exceptional conditions.—Amer. Drug., Dec. 25, 1896, 384.

Rose Water—Extemporaneous Preparation.—Sidney Rauschenberger observes that rose water, whether distilled or prepared from the oil, has not the true odor of the fresh flowers. He has furthermore observed that the freshly prepared distilled water differs from that which has been kept for some time, and that the odor is improved by the process of aging, probably due to undergoing viscous fermentation. He now finds, after a comprehensive series of experiments and studies, that the true rose odor, which is lost during the distillation of the oil or water, may be restored by the addition of a little oil of cloves—this being the missing link, as it were—and after having used his formula with satisfaction during the past two years, is prompted to offer the following formula as yielding a satisfactory product: Rose oil, 2.5 Gm.; clove oil, 0.25 Gm.; alcohol, enough

for 100 Cc. If 10 Cc. of this spirit are mixed with 1000 Cc. of boiling water, and permitted to blend by age, a product is obtained which is eminently superior to the commercial rose water. If, after aging, the water is turbid, it can be clarified by filtration with a small quantity of calcium phosphate or kaolin, or by the addition of 0.065 Gm. of alum, and filtering after 24 hours' standing.—Amer. Drugg., Jan. 25, 1897, 38.

Saratica Bitter Water—Constituents.—According to S. Habermann, Saratica Bitter Water, a new mineral water, has the following mineral constituents in every 1000 parts: sodium chloride, 1.3511; sodium sulphate, 17.9203; magnesium sulphate, 18.9291; potassium sulphate, 0.8575; magnesium carbonate, 1.2574; strontium and lithium sulphate. 0.0050; silicic acid, 0.0161 = Total, 36.3365.—Pharm. Rev., Aug., 1896, 188; from Pharm. Post, *29* (1896), 235.

Seltzer Water—Convenient Formula.—Holfert communicates the following well-tried formula for preparing seltzer water on a small scale: sodium bicarb., 2.1 Gm.; sodium chloride, 1.68 Gm.; calcium chloride, 0.1 Gm. This quantity is sufficient to make one liter of water, and each salt is to be separately dissolved in water, the solutions filtered, and poured together just before impregnating with carbonic acid gas. There is a slight cloudiness when the solutions are mixed, due to the formation of calcium carbonate, but this disappears immediately on impregnation; and the presence of the calcium carbonate in the water gives the latter the sharp, refreshing taste desirable in a water, that, without it, tastes rather insipid.—Merck's Rep., June 15, 1897, 374; from Pharm. Post, 1897, 257.

CAPSULÆ.

Hard Capsules—Advantageous Use for Dispensing Oily Fluids.—Emil Ferte finds that the ordinary cylindrical (hard) gelatin capsules may be profitably used for dispensing oils, such as cubeb, sandal wood, etc., and that capsules so filled give better satisfaction than the ovoid soft capsules. Procure a well-seasoned board, about 1 Cm. thick, and make as many holes in it as the number of capsules you wish to fill at one time. It is a good idea to make holes to accommodate the different sizes of capsules in the same board. Nail a thinner board on one side which is to be the bottom. Have the holes just large enough to hold the capsule without squeezing too hard. Put the empty capsules in the holes and proceed to fill. Use small bottles fitted with the patent stopper-pipette (used as eye-droppers) and keep the oils in them. One pipetteful will fill from three to six capsules, and it can be done without getting any on the outside of the capsule. Do not fill too much. Let the upper part of the meniscus be just below the upper edge of the capsule. To seal, use a camel's-hair pencil and the following solution: Gelatin (Cox's) 10 Gm.; acacia, 50 Gm.; boric acid, 1 Gm.; distilled water to make 100 Cc. of solution. This solution is to be heated to about 40° C. when using, and experience

will teach just how much to use, which should be sufficient to make a good seal, yet not enough to "slobber." Put the cover on with a spiral motion, pressing gently.—West. Drug., Aug. 1896, 347; from "Spatula."

Thyroid Capsules—Preparation.—The following method for the preparation of thyroid gland capsules is recommended by Vigier. The gland is carefully dissected out and all fat and membrane removed. The gland substance is then beaten to a pulp and immediately mixed with borax or with wood charcoal. The mass so formed is weighed out into 10 centigramme portions, which are enclosed at once in capsules.—Pharm. Journ., Aug. 22, 1896, 174; from Journ. de Pharm. d'Anvers.

Creasote Wafers—Formula.—E. Kopp states that creasote may be dispensed in wafers by mixing 1 p. of creasote with 1 p. benzoin and 6 p. powdered charcoal. The prescribed quantity is then introduced in each wafer in the usual manner.—Phar. Centralh., 1897, 33.

CERATA ET UNGUENTA.

Pharmacopœial Ointments—Critical Experiments.—"Galen, Jr.," observes that the Committee on Revision of the United States Pharmacopœia has not been conspicuously active in the elaboration of formulas, either for bases or for compound ointments. Benzoated lard and simple ointments, which have been dropped from the Pharmacopœia of other nations, are still retained in the United States Pharmacopœia as bases for ointments. He further observes that in remarkable keeping with this disregard of the requirements of modern pharmacy and medicine, is the careless manner in which ointments are dispensed generally by pharmacists who are otherwise careful as to the appearance and composition of the other galenicals dispensed by them. Much more importance is attached to the dispensing of ointments on the continent of Europe and in England than is usual here. There is probably no single base that would prove satisfactory for all ointments, but it is evident to many that benzoated lard might easily be replaced in a number of formulas with a base yielding a more satisfactory ointment. The author passes the official ointments in critical review, and makes suggestions which can only be briefly noted here:

Ung. Acidi Carbolici.—The proportion of carbolic acid (reduced from 10 per cent. (1880) to 5 per cent. (1890) is still in excess of the usual requirement. The tendency of the acid to separate when the ointment is kept in a warm place is overcome by incorporating the acid with a portion of glycerin and lanolin and making up the bulk with soft petrolatum.

Ung. Acidi Tannici.—This is improved by using a base compound of lanolin, 1 p. and petrolatum 3 p., and incorporating this with 4 p. glycerite of tannin.

Ung. Aquæ Rosæ.—The official formula is satisfactory.

Ung. Belladonnæ.—A more permanent product would be obtained by using a base of lanolin and petrolatum.

Ung. Diachylon.—Precipitated lead oleate and soft petrolatum, as suggested by Professor Good, are probably more satisfactory than the present components.

Ung. Hydrargyri.—Lanolin offers an excellent base, and greatly facilitates the extinguishment of the mercury.

Ung. Hydrargyri Ammoniati.—This is satisfactory.

Ung. Hydrargyri Iodidi Rubri.—This ointment, while no longer official, is still used. Like the ammoniated mercury ointment, a smoother ointment results if the mercurial compound is rubbed up with a little bland oil to a paste before adding the base.

Ung. Hydrargyri Nitratis.—A faultless formula, but necessary that directions be carefully followed.

Ung. Hydrargyri Oxidi Flav. and

Ung. Hydrargyri Oxidi Rub., can be improved by using a base composed of lanolin 1 p., and white petrolatum 3 p. The mercury oxides must be reduced in each case to impalpable powders, and then should be rubbed up with a little water.

Unguent. Iodi.—Petrolatum is preferable to benzoated lard.

Unguent. Iodoformi.—This should be freshly prepared.

Unguent. Picis Liquidæ.—The formula is faultless.

Unguent. Plumbi Carbonatis.—This is best made by the aid of an ointment mill to secure a smooth ointment, the lead carbonate being first rubbed up with a little oil of sesame.

Ung. Plumbi Iodidi.—The formula, observed with care, is a good one.

Ung. Potassii Iodidi.—Will not keep. Best prepared by increasing the quantity of water three-fold, and using lanolin with a suitable proportion of petrolatum.

Ung. Stramonii.—Like "Ung. Belladonnæ," which see.

Ung. Sulphuris.—Same as "Ung. Plumbi Carbonatis," which see.

Ung. Veratrinæ.—Satisfactory, if directions are carefully followed.

Ung. Zinci Oxidi.—Impossible to turn out a faultless ointment by the United States Pharmacopœia process. In quantities a paint mill should be used. In small quantities the zinc oxide should be preliminarily rubbed to a smooth paste with sesame oil.—Amer. Drug., Aug. 16, 1897, 63–64.

Ointments of the B. P.—Revision of Formulas.—E. W. Lucas has experimented with the view to improving the ointments of the forthcoming revision of the B. P. With the exception of a few, which require special processes, they may be divided into two classes: *Class A*, containing medicaments intended for absorption, such as aconitine, atropine, belladonna, etc. For others he advocates simple admixture of the medicinal substance with a base of prepared lard containing 3 minims of oil of cloves

to each ounce. This basis might be called "Adeps odoratus," is a whiter preparation than the official benzoinated lard, blander, and endowed with better keeping properties. *Class B* embraces the ointments that are used as dressings for wounds or sores, of which boric acid, carbolic acid, iodoform ointments, etc., may be taken as the type. For this class he advocates the use of a mixture of solid hydrocarbons, melting completely at not below 115° F., and not requiring a higher temperature than 120° F. Such a mixture might be known as "Unguentum petrolei," or "Unguentum simplex."

Exceptions to these two classes are:

Unguentum Cetacei, made with spermaceti 1 p., and soft white paraffin, 4 p.;

Unguentum Hydrargyri, made with equal parts of mercury and anhydrous wool fat;

Unguentum Picis, made by melting together 4 parts of Stockholm tar and 1 part of hard paraffin;

Unguentum Resinæ, made by melting together 8 parts of resin, 4 parts of yellow wax, 3 parts of hard paraffin and 15 parts of soft paraffin; and

Unguentum Hydrargyri Nitratis, the directions for which should be the following, conforming in every particular to those followed in the laboratory of the firm of John Bell & Co., who had a considerable reputation for its manufacture for several generations: "Dissolve the mercury in the nitric acid without the aid of heat, agitating gently from time to time. Melt the lard in the oil and raise to a temperature of about 380° F. Pour into an earthen vessel previously made hot, capable of holding ten times the quantity, and when the mixture has fallen to about 350° F., add by degrees the cold mercury solution, stirring briskly with a wooden spatula to promote disengagement of the former. Keep stirred until cold. If these directions are closely followed a pale lemon-colored ointment will result, which only acquires a slight orange tint, even after keeping several months." *—Pharm. Journ., February 13, 1897, 121.

Ointments—Preservation by Formaldehyde.—Frederick Leiter, finding benzoin, balsam of Peru, storax, etc., unsatisfactory, has experimented with formaldehyde, as follows: One pound of prime lard was heated just sufficiently to soften well, and into this 2 drams of formaldehyde was stirred thoroughly. This lard was cooled and placed on a shelf where it was exposed to summer temperature. This lard is as fresh and prime as when first mixed, and shows not the slightest sign of rancidity. The experiment was repeated with oxide of zinc ointment, and the results were equally as satisfactory. While not conclusive, the author regards these results as encouraging and worthy of further trial.—West. Drug., Aug. 1896, 345.

* Evidently the ingredients and proportions are those of the B. P.—Rep.

Adipatum—A New Ointment Base.—The "Zeitschr. Oest. Apoth. Ver." (Sept. 10, 1896, 687), describes a new ointment base, introduced under the coined name of "adipatum," as being composed of: paraffin, 7 p.; anhydrous lanolin, 35 p.; yellow vaselin, 53 p.; water, 5 parts.

Mercurial Ointment—Preparation with Wool-Fat.—F. Miehle finds anhydrous wool-fat to be an excellent base for mercurial ointment, 12 Gm. serving to extinguish 40 Gm. metallic mercury within 20 minutes. He recommends that a concentrated ointment, 80 p. mercury and 20 p. wool-fat, be kept in stock, and that this 80 per cent. ointment be reduced as required.—Pharm. Ztg., 1896, 880.

Ointment of Yellow Oxide of Mercury—Preparation.—To obtain a smooth ointment of yellow oxide of mercury expeditiously Frank Edel proceeds as follows: Take the required amount of yellow oxide of mercury, place it in a mortar, add water gradually, rubbing thoroughly to a smooth, even, thin paste, then add a small amount of lanolin, and triturate thoroughly; then add the petrolatum or lard as ordered and mix thoroughly. This can be done easily and rapidly and yields an unexceptional ointment. It is wonderful how easily the water reduces the mercury to impalpable fineness and aids in making a perfect ointment.—West. Drug., Nov., 1896, 487.

Resorcin and Ammoniated Mercury Ointment—Prescription Difficulty.—Robinson has observed when making an ointment composed of resorcin, 30 grains, ammoniated mercury, 25 grains, white vaseline, 2 oz., two different products are obtained by adopting different methods of manipulation. If the chemicals are simply powdered and then mixed separately with a portion of the vaseline, and then together, a permanently white ointment results; but if, as most dispensers would do, the resorcin is dissolved in a little alcohol, the ointment after a few days shows signs of becoming blue, and after some time acquires a deep indigo blue color.—Chem. & Drugg., Nov. 7, 1896, 677.

Unguentum Hydrargyri Nitratis—Suggestions Concerning its Preparation.—T. W. Squire compares the B. P. and U. S. P. formulas for ointment of mercuric nitrate, and makes suggestions concerning the nature of the fat, the relative quantity of nitric acid, and the manipulation. Instead of lard oil, as used in the U. S. P. formula, he suggests to retain the mixture of lard and olive oil, as official in the B. P. for the past fifty years. He advises also the larger quantity of nitric acid adopted in the B. P., 1885. As to the manipulation, good results can be obtained either by the method of adding the acid solution of mercuric nitrate to the mixture of fats, or by adding the solution of mercuric nitrate after the fat has been acted upon by a proper proportion of the nitric acid; it being necessary only to observe proper precautions as to temperature. But on the whole, the author apparently prefers the preliminary action of the acid. The ingredients

being used in the proportions of the B. P. formula, the lard and oil are heated to 100° C., and one-half the prescribed quantity of nitric acid is added. The heat should then be gradually raised until brisk effervescence takes place. This will commence about 105° C., but not briskly until 120° C. is reached, when the heat should be turned off. Chemical action will then raise the temperature several degrees, but this will not matter. When effervescence has ceased, allow the product to cool to 60° C., then add at the same temperature the mercury which has been dissolved in the remaining half of the nitric acid, and stir diligently until cold.—Pharm. Journ., Feb. 27, 1897, 172–173.

Ointment of Mercuric Nitrate—Suggestion of Modified Formula.—Joseph W. England, as the result of a critical review of Mr. Squire's paper (see above), makes some practical suggestions regarding the present U. S. P. process for making ointment of mercuric nitrate, and suggests the following formula for trial: Red mercuric oxide, 75.5 Gm.; nitric acid, 175 Gm.; lard oil, 750 Gm.; glycerin, 50 Gm. Heat the lard oil in a glass or porcelain vessel to 100° C., withdraw heat, and gradually add 75 Gm. of nitric acid. When the reaction moderates, re-apply the heat until brisk effervescence takes place, and then withdraw heat until active effervescence subsides. Then gently heat until effervescence ceases, stirring the mixture with a wooden spatula throughout the foregoing process as long as effervescence takes place. Having dissolved the red oxide of mercury in 100 Gm. of nitric acid, with the aid of sufficient heat, add the solution gradually to the oxidized fat—previously cooled to 60° C.—and stir the product until cold. When nearly cold, add 50 Gm. of glycerin, and admix thoroughly.

A diligent stirring of the fat and oxidizing material during effervescence facilitates oxidation and hastens the end reaction. The possible objection to the addition of glycerin to this ointment, on the ground that nitroglycerin may be formed, is in the author's opinion and experience unwarranted, since the production of nitro-glycerin requires a large excess of sulphuric acid over the quantity of nitric acid used; a condition which does not obtain in this ointment.—Amer. Jour. Pharm., April, 1897, 209–212.

Ointment of Mercuric Nitrate—Efficiency of the U. S. P. Formula.—Charles H. La Wall, referring to the papers of Messrs. Squire and England (see above), observes that it is extremely likely that those who fail to produce a satisfactory preparation by the U. S. P. process would not succeed by any method. While Mr. Squire slightly favors the use of a combination of lard and olive oil, he acknowledges the superiority of the U. S. P. process in previously acting upon the fatty base with a portion of the nitric acid. The suggestion as to temperature, which is emphasized also by Mr. England, is one of great importance, as experience has shown in the manufacture of a total of hundreds of pounds, that careful observance and

control of temperature is essential for the production of a satisfactory ointment. The directions might be supplemented by advising the maintenance of the temperature of 60° C. until all reaction ceases, in order to obviate the development of the spongy condition so often noticed in this product. The reasons given by Mr. England for substituting red mercuric oxide for the metal, viz., greater purity and greater accuracy, are not valid; for the weighings can be made equally accurate with either substance, while the preponderating evidence is in favor of the greater purity of the metal. Finally, the addition of glycerin may be advantageous in some respects; but if it shall prove so, a corresponding quantity of fatty body must be omitted, so that the mercurial strength of the preparation may not be reduced.—Amer. Jour. Pharm., May, 1897, 232–234.

In a rejoinder Mr. England defends his suggestion to use red mercuric oxide on the ground that this compound is always in stock in the average pharmacies, while the metal is not. It is therefore in the line of increased convenience. So far as the relative purity of the two substances is concerned, he adds the testimony of several manufacturing firms, who regard the oxide as being equal if not superior in that respect to the metal. The addition of glycerin is *not* to prevent *sponginess*, but to prevent the hardening and ultimately friable condition that obtains in the ointment on long standing.—Ibid., 311–313.

Hebra's Salve—Preservation under Water.—Dr. Karl Dieterich's experiments have led him to the conclusion that the addition of water to Hebra's salve prevents rancidity, inasmuch as it facilitates the conversion of the separated acids into soluble acid lead salts. He furthermore finds it advantageous to preserve the salve, so prepared, under water.—Zeitschr. Oest. Apoth. Ver., July 10, 1896, 532.

Zinc Ointment—Preparation by the Aid of a Paint Mill.—Frank Edel observes that he has for years prepared ointments containing large quantities of insoluble substances by means of a paint mill, and he recommends such a mill particularly for making zinc ointment. In making large quantities of this ointment, however, it becomes a tiresome operation, and he has therefore recently experimented with the view to shortening the process. He finds that when the zinc oxide is passed through the mill with a small portion of the lard, previously liquefied, the smooth parts may be mixed with the rest of the melted lard, when, after thorough stirring and cooling, a perfectly smooth and satisfactory ointment results.—West. Drug., Nov., 1896, 488.

Ointment of Eucaine A—Formula.—Professor Liebreich recommends an ointment of Eucaine *A* for the production of anæsthesia on mucous membranes and painful wounds, to be prepared from 1 p. of hydrochloride of Eucaine *A.*, 2 p. of olive oil, and 7 p. of lanolin.—Pharm. Centralh., *38*, (1897), 281.

Mayer's Ointment—Formula.—The "Western Druggist" (October, 1896, 444), reproduces the formula for Mayer's ointment, a preparation similar to the ancient one known as "mother plaster," and long kept a secret until the formula was published by J. U. Lloyd a few years ago, as follows: To olive oil, two pounds and a half, add white turpentine, half a pound; beeswax, unsalted butter, of each, four ounces; melt them together and heat to nearly the boiling point. Then add gradually red lead, one pound, and stir constantly until the mixture becomes black or brown; then remove from the fire, and when it has become somewhat cool, add to it a mixture of honey, twelve ounces, and powdered camphor, half a pound. The ointment, when properly prepared, has a dark brown color (not red) and it is about the consistence of simple cerate. The prominent odor of camphor overcomes the peculiar odor of the other ingredients, and even the familiar rank odor of olive oil that has been heated in contact with litharge or red lead is scarcely perceptible. Mayer's ointment should be perfectly smooth and free from grit or roughness. It forms a superior salve, which is useful for ulcers, cuts, wounds, etc., and is highly prized by those who have used it.

Toilet Creams, etc.—New Formulas.—The following formulæ are published in "Pharm. Journ.," (Nov. 28, 1896, 468) with the request that records of experience with them are desirable communications to that journal:

Lanolin Toilet Cream.—Mix 1 ounce of powdered white soap with 4 ounces of lanolin, gradually add 16 fluid ounces of rose-water with constant stirring, and lastly add 1 fluid ounce Ess. Bouquet.

Glycerin Cream.—Rub 1 ounce of zinc oxide and 20 grains of carmine perfectly smooth with 2 ounces of glycerin, then add 1 ounce of rose water.

Cold Cream.—Dissolve 1 drachm of borax in 9 fluid ounces of rose water, made slightly warm. Melt 2 ounces of white wax and 2 ounces of spermaceti in 14 ounces of oil of sweet almonds, and mix these with 6 ounces of lanolin, contained in a hot mortar, until a smooth mixture is effected. Then gradually stir in the solution of borax, and continue stirring until almost cold. Finally add 15 minims each of oil of bergamot and oil of ylang-ylang, and 5 minims each of oil of neroli and oil of rose geranium.

Camphor Ice.—Melt 4 drachms of white wax and 4 drachms of spermaceti in 1 ounce of oil of sweet almonds; add 4 drachms of camphor, 5 minims of oil of eucalyptus, and 15 minims of oil of bergamot, and pour while warm into the pots or boxes.

Ointment for Chapped Skin—Formula.—The "Journ. des Practs." gives the following formula for an ointment for chapped skin: Woolfat, 3 ounces; glycerin, 4 drachms; boric acid, 1½ drachms; salol, 1 drachm; Hoffman's anodyne, 5 drachms; menthol, 15 grains; oil of citronella, 3 minims.—Pharm. Journ., Aug. 22, 1896, 174.

CHARTÆ.

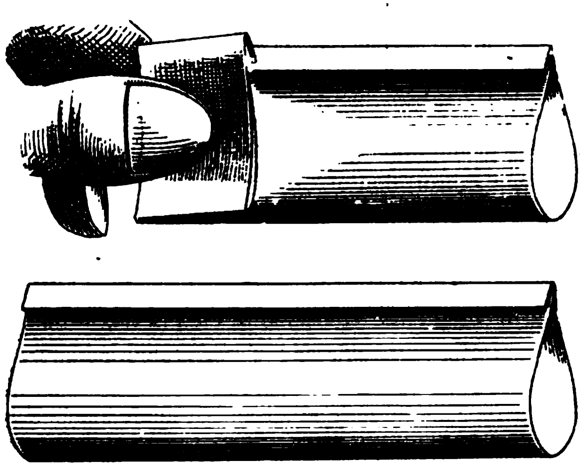
Sensitive Litmus Paper—Preparation.—Ronde gives the following method whereby he readily obtains litmus paper of a sensitiveness 1=150,000. The strong alkaline cubes occurring in commerce are covered with twelve to fifteen times their quantity of water, and allowed to stand for one day. The deep blue mixture is then treated with sulphuric acid until it becomes a light red, and heated on a steam-bath for fifteen minutes. To the liquid, which generally turns blue again, dilute sulphuric acid is added until the filter-paper becomes of a reddish-violet on immersion. When cold it is strained through a cloth, and the liquid is so adjusted, by the addition of drops of dilute sulphuric acid or traces of powdered litmus, that pieces of filter-paper, if immersed and quickly dried, take the desired red or blue tint.—Chem. News, Jan. 22, 1897; from Chem. Ztg.

Potassium Iodate Starch Paper—Preparation.—The following method for making potassium iodate starch test-paper is given in Chem. Centralbl. (1896, 513): A starch paste is made from 2 gm. of wheat starch and 100 Cc. of water, to which 0.2 gm. KIO_3 is added. Paper is saturated with this mixture and dried. It is blued by traces of free SO_2. If combined it may be liberated by HCl.—Pharm. Rev., Oct., 1896, 234.

Formaldehyde-Gelatin Paper—A Substitute for Gutta-percha Paper.—According to a recent German patent a substitute for gutta-percha paper, impervious to water, is obtained by saturating paper or textile fabrics with a solution of gelatin or glue and subjecting this to the action of either gaseous or liquid formaldehyde.—Ztsch. Oest. Apoth. Ver., Jan. 10, 1897, 29.

Powder Papers—A New Ready Folded Form.—E. Siegmund has pat-

FIG. 42.



Powder Papers.

ented and introduced the ready folded powder papers (Falz-capseln) shown in the accompanying cut (Fig. 42). These possess many conveniences over the ordinary folded powder papers, from which they differ in being folded on one side only. They are then kept open by the elasticity of the paper, rendering the introduction of the powder into them very easy.—Pharm. Rev., Nov., 1896, 261.

Perfumed Fumigating Papers—Formulas.—The "Journ. de Pharm" (6), iv, 77, gives the following directions and formulas for preparing perfumed fumigating papers, taken from "Rev. de Chim. industr.": The paper to be used, whatever the perfume afterwards employed may be, is first converted into "touch paper" by immersing it in a cold saturated solution of potassium nitrate, and drying on strings. Unsized paper, such as ordinary filter paper, should be used. It is perfumed by dipping into any of the following essences and again drying:

Papier d'Armenie.—No. 1: Musk, 10; otto of rose, 1; benzoin, 100; myrrh, 12; powdered orris root, 250; strong spirit of wine (64 per cent.), 300 parts by weight. No. 2: Benzoin, 80; balsam of Tolu, 20; storax, 29; yellow santal wood, 20; myrrh, 10; cascarilla, 20; musk, 1; alcohol (64 per cent.), 200 parts by weight.

Papier d'Orient.—No. 1: Oil of cloves, 30; oil of cinnamon, 36; oil of bergamot, 48; oil of lavender, 48; tincture of benzoin, 420 parts, by weight. No. 2: Balsam of Peru, 15; oil of cloves, 30; oil of bergamot, 30; acetic ether, 36; essence of musk, 6; essence of vanilla, 60; tincture of benzoin, 160; tincture of cedarwood, 30. Other aromatic combinations may be made on similar lines.—Pharm. Jour., July 25, 1896, 65.

COLLODION.

Neuralgic Collodion—Formula.—The following formula for a collodion mixture for neuralgic and localized pains is given in "Chemist and Druggist" (Sept. 12, 1896, 425): Amyl. hydrid., Collodion, B. P., each 1 ounce; aconitine, 1 grain; veratrine, 6 grains. Mix. This mixture should be brushed over the painful part five or six times, forming successive films. If there is no relief, absorption of the alkaloids may be favored by covering the colloid film with a layer of spongio-piline.

Solution of Celloidin—A Substitute for Collodion.—Dr. Williamson advocates the use of celloidin (see Proceedings, 1896, 473), as a substitute for collodion in dressing cuts, excoriations, etc., in fact for all purposes for which collodion is ordinarily used, the pellicle formed being more tenacious and durable than that of collodion. It is made by dissolving 2 parts of celloidin in 15 parts each of pure ether and absolute alcohol. Before applying this solution, the parts should be quite dry.—Brit. Med. Journ., 1896.

ELIXIRES.

Palatable Elixirs—Formulas.—Frank Edel gives formulas for several palatable elixirs, as follows:

Aromatic Elixir of Kola.—Mix together 2 ozs. of fluid extract of kola, 30 grains of saccharin, 41 drams solution of licorice (N. F.) and sufficient simple elixir to make 16 fl. ozs. Let stand several days and filter. An efficient

Adjuvant Elixir is obtained by mixing together: 1 oz. of solution of licorice (N. F.); 15 grains of saccharin; and sufficient elixir of orange to make 16 fld. ozs.; then filtering.

Elixir Cathartic Compound is made by mixing together: 1 oz. fld. ext rhubarb; 2 ozs. fld. ext buckthorn; 1½ ozs. fld. ext. senna; 10 drops oil of peppermint; 30 minims solution of potassa; 30 grains saccharin; 4 drams solution of licorice (N. F.), and sufficient aromatic elixir to make 16 fld. ozs. Allow to stand 24 hours and filter if necessary.—West. Drug., Sept., 1896, 392.

Elixirs and Essences of Pepsin—Commercial Quality.—Conrad Engsberg has examined a large number of elixirs and essences of pepsin made in pharmacies and by manufacturers and finds them as a rule to be of satisfactory strength according to label. Old preparations of the same make were, however, not as strong as fresh ones.—Proc. Wisc. Pharm. Assoc., 1896, 50-53.

Elixir Secalis Cornuti Ferratum—Formula.—Prof. Gay recommends the following formula for preparing a ferrated elixir of ergot, which he recommends as convenient for the administration of ergot and iron in a palatable form: Extr. secalis corn., 1.0; ferri et ammon. citr., 10.0; glycerin, 100.0; alcohol (90°), 300.0; spir. meliss. comp., 30.0; syrup simpl., q. s. ad 1000.0. Mix. A tablespoonful contains 0.02 gm. ergotin and 0.2 gm. ammonio-citrate of iron.—Zeitschr. Oest. Apoth. Ver., Aug. 10, 1896, 599.

EMULSA.

Emulsions—Preparation with Pancreatic Juice.—Dr. John F. Russell subjects the emulsionizing of oils by means of gums and the like to adverse criticism, and maintains the following to be the necessary features of an oil emulsion:

1. They should contain no mucilage or gum of any kind, or other innutritious substances.
2. They should contain as much oil or fat as possible.
3. The globules should be finely divided, and should correspond to the standard.
4. The object of these preparations is to furnish a predigested food.

In searching for a method of preparing an emulsion that should fill these

requirements, he has found that the well-known method of emulsionizing solid fats with pancreatic juice answers all requirements. There is no foreign matter, the size of the globules is sufficiently small, and the author finally adopted, with necessary modifications (which are however not given !—Rep.). this theory of making oil emulsions.—West. Drug., Mar., 1897, 116–119.

Saponin Emulsions—Practical Formulas.—Schazki recommends saponin as being preferable to gums, alkali, yolk of egg, or other substances for pharmaceutical emulsions, and states that when used in the proportions given in the following formulæ it is absolutely harmless:

Cod-Liver Oil Emulsion: Cod-liver oil, 100 Gm.; saponin, 0.20 Gm.; water, 100 Gm.; oil of peppermint, 2 drops.

Castor Oil Emulsion: Castor oil, 30 Gm.; saponin, 0.15 Gm.; water, 150 Gm.

Copaiba Emulsion:—Copaiba, 5 Gm.; saponin, 0.12 Gm.; water, 95 Gm.

Creosote Emulsion:—Creosote, 1.25 Gm.; oil of sweet almonds, 10 Gm.; saponin, 0.06 Gm.; water, 100 Gm.

Iodoform Emulsion:—Iodoform, 2 Gm.; oil of sweet almonds, 8 Gm.; saponin, 0.18 Gm.; water, 100 Gm.

Chloroform Emulsion:—Chloroform, 0.50 Gm.; oil of sweet almonds, 15 Gm.; saponin, 0.12 Gm.; water, 100 Gm.

Camphor Emulsion:—Camphor, 0.80 Gm.; oil of sweet almonds, 15 Gm.; saponin, 0.12 Gm.; water, 100 Gm.

Santonin Emulsion:—Santonin, as prescribed; Castor oil, 15 Gm.; saponin, 0.12 Gm.; water, 100 Gm.—Pharm. Journ., Nov. 7. 1896; from Rev. Pharm. des Flandres. through Bullet. Comm., xxiv, 272.

ENEMATA.

Nutritive Enemata of Cod-Liver Oil—Various Formulas.—The following formulas for cod-liver oil preparation for rectal alimentation are given in "Journ. des Practiciens:"

No 1: Cod-liver oil, 5 fluid ounces; yolk of one egg; lime water, 10 ounces. Sufficient for four or five enemata, which may be given during the day.

No. 2: Cod-liver oil, 5 ounces; yolk of one egg; salt, 40 grains; water, 10 ounces.

No. 3: Cod-liver oil, 1 pint; gum tragacanth, 35 grains; gum acacia, 1½ ounce; hypophosphite of calcium 35 grains; lime water to make 40 fluid ounces. From four to six ounces to be used for each injection.

EXTRACTA.

Plant Extracts—Investigation of Some of their Inert Constituents.—Prof. Aug. Bělohoubek observes that a review of the pharmaceutical litera-

ture upon the subject of plant extracts reveals that most of the articles are confined to the consideration of the solvents or methods of extraction, the removal of the solvent from the extractions with the view to their concentration, or with the qualitative or quantitative determination of one or the other of their more active components. The less active components are rarely taken into consideration, in consequence of which our knowledge of the constitution of plant extracts is at best only fragmentary and far more obscure than is the case with other pharmaceutical products. The analysis of the very complicated mixture composing plant extracts, however, presents many difficulties, and our knowledge of these components will doubtless remain imperfect for a long time, though in view of the interest taken in this subject by a large number of industrious experimenters, we may confidently look forward to the eventual lifting of the veil that at the present time obscures this important group of medicaments.

One of the difficulties that greatly impede these investigations is encountered in the changes that occur in some of the chemical components of the plant during the preparation of the extract, and particularly during the process of evaporation, etc., so that on the one hand certain substances originally present in the plant are no longer determinable, while on the other, new substances are formed that did not previously exist. An example of these products of change is furnished by those components of extracts that determine their brown color (extractive? Rep.), notwithstanding that the extraction may have originally been free from brown color or even colorless. It is a pertinent inquiry what produces this brown color, and whether the brown body constitutes an important or unimportant component of the extracts. The author concludes from his studies and experiments that the brown color is due to the formation of humin substances, by the action of light, air and heat, individually as well as collectively, upon those components of the plant which in their soluble form serve in the living plant for the formation of starch, sugar, fat, etc. They evidently possess the function of aldehydes and ketones, and are easily transformed into the bodies named by the vital process, or into humin bodies by the influence named. Hence, brown color of plant extracts is the more intense, the longer the extractions have been exposed to air and light before their concentration, and the higher the temperature of evaporation. In some degree the conversion of sugar into caramel also contributes to this brown color of extracts.

Another source of difficulty in the examination of extracts is the presence of substances which in their isolated conditions are insoluble in the menstruum with which the extract has been prepared. Thus, for example, the author extracted "folia graminis" with warm water, filtered the infusion repeatedly until clear, and evaporated it to dryness. The residue yielded to chloroform a small quantity of a fat, containing a phytosterin which when dissolved in acetic acid gives with sulphuric acid the char-

acteristic cherry-red color, followed by violet, green, and eventually brown color. Neither the fats nor phytosterins are active or important constituents of the extracts; but if it is considered that small amounts are dissolved by the water in making aqueous extracts, it is evident that the alcoholic and ethereal extracts must contain much larger quantities, and that their presence may interfere with the qualitative and quantitative examination of these preparations for the more energetic and active constituents (alkaloids, &c.).—Zeitschr. Oest. Apoth. Ver., Sept. 1, 1896, 647–652.

Solid Extracts—Yield and Standardization.—Charles H. LaWall at the meeting of the Penna. Pharm. Assoc., (1896) read a paper on fluid extracts and their standardization which contains much that may enlist the interest of pharmacists, and particularly the revisers of the Pharmacopœia. He observes that it is particularly noticeable that the solid extracts have not shared, to any great extent, in the improvements of the past few decades, but that the same lack of uniformity exists at the present time as was formerly the case. It is a matter of grave importance when we realize that the quantity of extractive matter obtained from a drug bears no definite ratio to the percentage of active constituents or to its medicinal efficacy, but is influenced almost solely by the degree of dilution of the alcoholic menstruum employed in the percolation of the drug. Unscrupulous manufacturers can thus increase the quantity of an extract at the expense of quality, and among leading manufacturers of the present time the watchword is therefore "standardization," whereby a certain uniformity may be developed in these and other preparations, which at present does not exist. With a view to giving aid in this direction, Mr. LaWall communicates a list of the average yield of solid extract obtained in actual practice from those official drugs to which, in his opinion, standardization might easily be applied, and gives also in each case the average percentage of alkaloid present in the drug, and the standard to which the solid extract should conform in alkaloidal content, as follows:

EXTRACTS.	Average per cent. of extract obtained.	Average per cent. of alkaloid present in drug.	Percentage of alkaloid required in a solid extract of standard strength.
Aconite root	19	0.50	2.50
Belladonna leaves, (alcoholic)	20	0.40	2.00
Cinchona	26	2.50	10.00
Colchicum root	25	0.50	2.00
Conium	28	0.50	1.75
Hyoscyamus	20	0.18	0.90
Physostigma	5	0.20	4.00
Stramonium seed	20	0.35	1.75

The percentage of alkaloid in cinchona—drug and extract—refers to

quinine. In the case of two drugs—opium and nux vomica—a standard for the alkaloidal content of the extract has already been adopted. Mr. LaWall observes that he has obtained very favorable results in practice, with the above data, in the case of several of the drugs above enumerated, and he expresses the belief that but a short time will elapse until standardized extracts, both solid and powdered, will be the rule rather than the exception. He also gives the following list of yields of solid extract obtained from drugs, both official and otherwise, which is sufficiently interesting in itself to be placed on record here, but to which the mention of the menstrua employed would lend additional value:

Drug.	Per Cent. of Extract Obtained.	Drug.	Per Cent. of Extract Obtained.
Cannabis indica	13	Buchu	14
Cimicifuga	30	Cornus florida	7
Digitalis	20	Fucus vesiculosus	26
Ergot	14	Cubeb	20
Gentian	35	Colchicum seed	16
Liquorice, purified	55	Damiana	11
Jalap	27	Ignatia amara	19
Juglans	12	Sumbul	28
Leptandra	27	Rumex	40
Quassia	3.5	Viburnum prunifolium	15
Rhubarb	30	Senega	46
Taraxacum	35	Cotton-root bark	10
Uva ursi	30	Calumba	17
Logwood	5	Valerian	20
Xanthoxylum	6	Viburnum opulus	23
Gelsemium	10	Scutellaria	35
Conium leaf	30	Calendula	30
Hamamelis	25	Jaborandi	25
Triticum	18	Grindelia robusta	20
Kava Kava	7	Colchicum (acetic)	25
Pulsatilla	24	Scoparius	17
Serpentaria	10	Rubus	25
Chirata	15	Salvia	25

—Proc. Penna. Pharm. Assoc., 1896, 54–58.

Extracts—Method of Alkaloidal Assay.—C. Kippenberger recommends the following method for the assay of extracts: The extract is dissolved in warm acidulated water, the solution is filtered, allowed to cool, and neutralized as nearly as practicable. It is then precipitated with a solution of iodine in potassium iodide—containing 12.7 to 20 Gm. I and 60 Gm. KI per litre—the precipitate allowed to subside, collected in a filter, and washed with water until the washings pass perfectly colorless. The precipitate is then dissolved in the smallest possible quantity of acetone, heated with caustic alkali followed by acid in excess, mixed with water,

and shaken out twice with petroleum ether to remove any impurities soluble in that menstruum; the petroleum ether being in its turn washed with a little acidulated water. The acid aqueous liquids are then heated to drive off any acetone and petroleum ether retained by them; the liquid is allowed to cool, a few drops of sodium thiosulphate solution are added, followed by an excess of sodium carbonate solution, when the alkaloid may be shaken out in the usual manner with one of the alkaloid solvents customarily employed for this purpose. The results are in the author's experience very satisfactory. The method may be applied to the estimation of alkaloids in drugs.—Zeitschr. Oest. Apoth. Ver., Nov. 20, 1896, 865.

Extracts of the Austrian Pharmacopœia—Alkaloid Percentages.—Al. Kremel reports the results of assay, etc., of several extracts made in conformity with the Austrian Pharmacopœia (VII.), which are briefly as follows:

Extract. Belladonnæ fol., Ph. A. VII., yielded in three samples from 1.92 to 2.72 per cent. of alkaloid.

Extract. Opii Aquos., Ph. A. VII., yielded in fourteen samples from 16.60 to 25.50 per cent. of morphine.—Zeitschr. Oest. Apoth. Ver., Sept. 10, 1896, 684.

Narcotic Extracts—Advantageous Use of Acetic Acid as Menstruum.—According to J. Benysck, a larger yield of the extracts of belladonna, hyoscyamus and stramonium, as well as products of greater alkaloidal strength, may be had by employing acetic acid as a menstruum. This also renders it immaterial whether recent or dried plants are operated upon, since extracts of uniform strength are always obtained. It should be remembered, however, that the yield of plants gathered from poor soil is not only one-third less, but that the extracts obtained from such plants are from 0.18 to 0.40 per cent. weaker in alkaloidal strength. Extracts made in the summer by the above process also show a slightly greater alkaloidal strength than those made in the fall.—Merck's Rep., Aug. 15, 1897, 413; from Pharm. Post, xxix., 271.

Acetracts—A New Class of Extracts.—J. P. Remington, in connection with his paper on the use of *acetic acid as a menstruum and solvent* (which see under "Organic Chemistry") proposes the name of "acetracts" for solid extracts prepared from the drug with acetic acid.

Acetic Extracts of Spices—Method of Preparation.—Dr. E. R. Squibb, at the request of the editor of the "Western Druggist" (March, 1897, 123–124), communicates his method of preparing acetic extracts of spices —embracing allspice, black pepper, cardamom, capsicum, cassia, celery, cinnamon, clove, coriander, garlic, ginger, mace and nutmeg. These extracts are made by percolating the coarsely ground spices with 60 per cent. acetic acid. Dr. Squibb describes this process as follows:

We take 100 pounds of coarsely-ground capsicum, for instance, and put

it in a stoneware pot which has been previously fitted for percolation, and cover the powder with an equal weight of acetic acid. After standing 24 or 36 hours, as may seem best—the maceration is not objectionable—we put on acetic acid of the same strength, 60 per cent., successively, until another 100 pounds have been put on, drawing off at the same time, so that we have 100 pounds drawn off and 100 pounds put on. We continue this drawing off and putting on of successive portions until we have put through the capsicum five times the weight of the spice in 60 per cent. acetic acid. If this percolation is done slowly, the capsicum is then practically exhausted, so that almost no pungent flavor can be detected in the spice. We then displace the acetic acid in the exhausted capsicum with water, and use that displaced liquid for spiced vinegar. We then throw away the exhausted capsicum and put on another 100 pounds of capsicum in the pot, putting on top of this charge the first 100 pounds that came off the previous charge, and after 24 or 36 hours' maceration, we add the second 100 pounds and draw off the first 100 pounds. The first 100 pounds of this second charge is not yet fully saturated, and consequently this process is gone through with three times. By so doing the 100 pounds of acetic acid are saturated and contain the extractive matter of 100 pounds of capsicum powder, so that the 100 pounds represents the spice in extractive matter. This extract is tested to know in how extreme a dilution we can detect its pungency. The percentage dilution in which the pungency can be detected is our standard. Of course, all spices vary, but not so much as to render this test useless. This form of test and this method of percolation apply to all the other spices on our list. The percolation must be conducted carefully and slowly, taking care that the packing in the pot is done loosely, and at the same time in such a way as to insure no cracking of the charge, and allowing the acid to trickle through without exhausting the powder. The size of the percolator, of course, depends entirely on the charge, some of our spices thus used in largest quantities requiring pots of 90 to 100 gallons capacity; others of 5 gallons capacity. The method of percolation, however, is the same in all.

Extract of Cannabis Indica—Solution in Water.—A correspondent of the "Chemist and Druggist" observes that if one-eighth of a grain of extract of cannabis indica be triturated with the proper amount of chloral hydrate (in saturated aqueous solution) required by the formula for mistura chlorali et potassii bromidi, it dissolves readily. The extract of henbane and potassium bromide may then be added and perfect solution effected.—Amer. Drug., Jan. 25, 1897, 45.

Hasheesh (Majoom)—Preparation in India.—Dr. Asutosh Ghose describes the preparation of "majoom" or "hasheesh," as practiced in India, as follows: Majoom is prepared from the leaves, tops and tender part of the plant called *Cannabis Indica* (*C. sativa*). Four ounces of such parts of the plant are taken, free from unripe fruit, flowers or other

impurities. They are thoroughly washed and three ounces of pure butter added to the leaves, with about four ounces of water. All these ingredients are put together in an earthen pot over a slow fire. The water is allowed to evaporate, leaving in the pot the buttered leaves, which are now strained through a piece of muslin. The strained greenish extract is removed with great care, the other impurities on the muslin being thrown away. The extract is then washed with pure water twice. In another pot about 16 ounces of sugar, with 32 ounces of water, and a little milk, are boiled. By repeated boiling and mixing of milk a syrup is prepared. In this syrup the greenish oily extract is put, and boiled on a slow fire. Now is the time to mystify the preparation. Some add datura seeds; others nux vomica seeds in finest powder. But the usual practice in Bengal is to add a few drops of oil of rose, or a few grains of musk, powdered cardamom seeds, and sometimes a minute quantity of opium. After boiling half an hour the whole mass is poured into a flat basin. It solidifies and is cut into cakes. Sometimes the best hasheesh is sold at sixteen rupees a seer, but usually the price is four rupees. Hasheesh is the Arabic hashish, which means "green intoxicating liquor," probably derived from the Hebrew shesh, which means "to be joyous."—West. Drug., June, 1897, 267; from "India Agriculturist" (see also "*Indian Hemp*" under "Materia Medica").

Extract of Strophanthus—Yield, etc., from Tincture.—Speaking of the extract employed by them, for their physiological experiments referred to under "strophanthin" (which see under "Organic Chemistry"), Drs. Wood and Carter state that this extract of strophanthus was made from the official tincture, the yield being 1 gram from 82.5 Cc., equal to 4.127 grams of the drug.—Amer. Jour. Pharm., July, 1896, 353.

Rhamnus Saccharatus—A New Medicament.—De Vrij recommends a preparation of *Rhamnus frangula* bark, which is prepared very similarly to the "Abstracta" formerly official in the U. S. P., differing only in that the finished product represents the bark weight for weight, whereas the abstracts represented, as will be remembered, twice the weight of the drug from which they were prepared. The percentage of dry extract from 100 p. of the bark, which must be of properly selected quality, having been determined, a dry extract is prepared by the vacuum process, and this is mixed with sufficient well-dried milk sugar to bring the total weight to that of the original bark used. When properly prepared, *Rhamnus saccharatus* is said to be a homogeneous, light brown powder which, being tolerably hygroscopic, must be preserved carefully protected from the air. —Zeitschr. Oest. Apoth. Ver., Nov. 20, 1896, 867.

EXTRACTA FLUIDA.

Fluid Extracts—Percolation Experiments.—L. E. Sayre communicates the results of a series of experiments undertaken independently by him-

self, by W. G. Gregory and by E. L. Patch, with the view to determine the following questions:

1. Will two parts of a suitable menstruum extract one part of drug in one operation under the conditions above stated?

2. If not, how much menstruum is necessary for complete exhaustion?

The results are given in the form of tables, that of Prof. Sayre being reproduced below, and depending upon the following experiments: (1) 10 grams of the drug were completely exhausted by the menstruum of the United States Pharmacopœia for that drug. The total amount of extractive from this was ascertained; this extractive was first heated on a water bath and afterwards in a hot-air oven until it ceased to lose weight. When the extract was dried to a constant weight its amount was recorded as a total extractive. (2) 100 grams of the drug, previously macerated in the official menstruum for that drug, were carefully packed in a percolator best suited to the quantity, the diameter of it being such as to give the maximum column to the powder; the percolators were almost cylindrical, measuring at the top about 35 Mm. in diameter and in length about 225 Mm. Percolation was then begun and the process continued until 200 Cc. of percolate were obtained; this was set aside as a 50 per cent. tincture. An aliquot portion of this was taken, evaporated and dried to constant weight, and from this the total amount of extractive in the 50 per cent. tincture computed. The percentage of extractive thus found is stated in column 3 of the table appended. Percolation was now continued until the drug was exhausted, but the second percolate in no case was allowed to exceed 800 Cc., making with the reserved percolate 1000 Cc. The extractive of the second percolate dried to constant weight is given in column 4. By adding together the figures opposite the drugs of columns 3 and 4, the percentage of total extract obtained in experiment 2 (recorded in column 2) is found.

Name of Drug.	1. Total extract obtainable.	2. Total extract actually obtained.	3. Extract from 50 per cent. tinct.	4. Extract from dregs.	5. Excess of menstruum for No. 4.	6.* Menstruum for No. 2.
Aconite	14.15	9.50	9.236	0.264	180	380
Apocynum	14.4	12.48	12.136	0.344	192	392
Belladonna (leaves)	22.7	19.36	13.24	6.12	740	940
Burdock	24.	19.16	16.73	2.43	400	600
Buchu	23.3	16.82	16.17	0.650	480	680
Belladonna (root)	9.65	5.496	4.80	0.696	400	600
Colchicum (root)	19.5	13.64	13.353	0.287	306	506
Cannabis indica	13.	9.78	8.949	0.831	264	464
Coca (leaves)	24.7	18.90	17.74	1.16	400	600
Conium (leaves)	28.6	21.30	19.52	1.78	352	552
Colchicum (seed)	19.45	15.32	14.735	0.585	476	676
Digitalis	34.1	27.52	26.686	0.834	680	880
Gelsemium	11.6	8.00	7.127	0.873	524	724
Hydrastis	23.2	15.9	15.322	0.578	656	856
Hyoscyamus	19.5	13.8	3.011	0.789	800	1000
Hydrangea	9.06	8.38	8.332	0.048	360	560
Ipecac	12.45	10.768	9.572	1.196	224	424
Lily of the Valley	33.5	27.94	26.65	1.29	640	840
Mezereon	11.8	8.38	8.184	0.196	374	574
Nux vomica	13.7	7.50	6.58	0.92	800	1000
Podophyllum	13.8	12.50	10.42	2.08	120	320
Poke root	17.12	12.68	11.695	0.985	310	510
Pleurisy root	25.2	20.30	19.845	0.455	344	544
Stramonium (seed)	14.1	11.96	11.486	0.474	272	472
Veratrum	18.	9.62	9.076	0.544	256	456
Viburnum opulus	15.2	10.44	10.117	0.323	160	360
Yerba santa	31.95	28.94	25.92	3.02	464	664
Jaborandi	23.58	19.6	19.446	0.154	292	492

* In a subsequent paper (Drug. Circ., June, 1897, 143) the author explains that the quantities here given are in addition to the amount of menstruum necessary to moisten the drug before packing in percolator.

Further experiments must be made to determine whether the extract given in column 2 represents practically all the constituents of the drug. The extracts from the dregs (given in column 4) of belladonna, digitalis and aconite were examined for active constituents. No very positive alkaloidal reaction was obtained from the first. Evidence of active principle was shown in the second, and 0.004 per cent. of alkaloid was found in the third, while a recent experiment with cinchona proves that alkaloid is abundant in the tincture received, much beyond the 200 per cent. percolate.—Drug. Circ., May, 1897, 119–121.

In a second paper Prof. Sayre records the results of some further experiments made to determine the amount of extractive obtainable from certain drugs under the most favorable conditions by extracting 100 grammes of the drug with menstruum by percolation until 200 Cc. of percolate were obtained. The results are given in percentages of the total amounts previously determined, and are as follows:

Podophyllum, 80.53 per cent.

Gentian, 77.65 per cent.

Belladonna leaves, 65.74 per cent.

Hydrastis, 81.14 per cent.

Mixed powder for compound tincture of gentian, 82.9 per cent.

Hyoscyamus, 76.38 per cent.

The present paper is also supplemented by letters from Dr. E. R. Squibb, J. U. Lloyd, Lyman F. Kebler and R. Wright (England), in which they express their opinion on the feasibility of making 50 per cent. tinctures by simple percolation. The opinions are in the main unfavorable. Dr. Squibb expresses the opinion that 50 per cent. tinctures cannot be made on any scale, while others are of the opinion that, as a rule, it can be done on the scale of the manufacturer, but not in the quantities that are likely to be made by the retail pharmacist, except in a very few instances.—Drug. Circ., June, 1897, 147–149.

Fluid Extracts—Improvement of B. P. Processes.—W. A. Jones points out in a paper read before the Chemists' Assistant's Association, London, that the B. P. methods of making liquid extracts are capable of improvement. He prefers the U. S. P. process, and spoke well of re-percolation, insisting, however, on three points necessary to success, viz: (1) the disintegrated drug should not contain too much dust; (2) too much menstruum should not be used in damping the drug, and (3) the damped drug should be carefully packed in the percolator. Speaking of waste of spirit, he recommends for the recovery of what is in the marc, pressure in the case of proof spirit and distillation when it is strong spirit.—Chem. and Drugg., Nov. 7, 1896, 677.

Fluid Extracts—Variability.—Speaking for British pharmacy, George Roe observes that the constant and increasing demand for fluid extracts, and the variability of the preparations sent out as such by different manufacturers, necessitates that only those should be used which have been obtained from a reliable source or made under personal supervision. The British Pharmacopœia contains a small number compared with the many preparations which have a more or less permanent place in our establishments. It is, perhaps, fortunate that more are not chosen out of the hundreds eloquently advertised in the price lists which are distributed so freely in this country. It is, however, satisfactory to find that out of this greatness many have been found worthy of a prominent position, and are frequently prescribed with much benefit by medical men. When properly made, an aqueous solution of the active ingredients of a plant is perhaps its best preparation, and there is not much difficulty in its manufacture, providing the raw material be obtainable. In the case of fluid extracts made with rare drugs by an enterprising firm, we are compelled, for a time at least, to obtain our supplies from them; but we have this advantage—the preparation is nearly always the same, while those obtained from two or more wholesale houses have differences which are distinctly to the dis-

advantage of the chemist and detrimental to the patient. Mr. Roe mentions a number of liquid extracts of the B. P. which are supplied of various densities, and all differing in depth of color, and calls the attention of manufacturers particularly to the necessity of supplying these important preparations as nearly as possible uniformly alike in physical characteristics.—Chem. and Drugg., May 22, 1897, 809.

Fluid Extracts—Preparation by the Aid of Dialysis.—Colaz gives the following process for obtaining fluid extracts from recent plants, so as to obtain their constituents in solution, not only in the form naturally present in the plants, but also in their natural proportion. The plants are gathered during dry weather, freed from all inert matter and impurities, then bruised until completely crushed, and placed in a dialyzer suspended in 90 per cent. alcohol. When the dialysis is complete, the alcoholic (between 30–45 per cent.) fluid obtained is freed from its alcohol by evaporation—the aqueous remainder retaining the active constituents of the plants in the proportions naturally present in them, a result that cannot be obtained by using dried plants, since by drying, as well as by the oxidation due to atmospheric oxygen, numerous changes are produced in them.——Merck's Report, Aug. 15, 1896, 413; from Pharm. Post, xxix., 271.

Fluid Extracts of the Austrian Pharmacopœia—Results of Valuation.—Al. Kremel reports the results of the valuation of several fluid extracts made in conformity with the Austrian Pharmacopœia (VII.), which are briefly as follows:

Extract Hydrastis Canad. fluid—Ph. A. VII.—In six samples the specific gravity varied from 0.933 to 0.958; the dry residue of evaporation, from 10.74 to 14.68 per cent.; the ash, from 0.152 to 0.366 per cent.; berberine, from 1.40 to 2.76 per cent.; hydrastine, from 0.80 to 0.96 per cent.

Extract Quebracho liquid—Ph. A. VII.—The sp. gr. in thirteen samples varied from 0.981 to 1.011; the dry residue of evaporation, from 2.51 to 8.96; the ash, from 0.295 to 1.030 per cent.

Extract Rhamni Pursh. fluid—Ph. A. VII.—The sp. gr. in four samples varied from 0.945 to 0.955; the dry residue of evaporation, from 11.24 to 15.39 per cent; the ash, from 0.350 to 0.727 per cent.—Zeitschr. Oest. Apoth. Ver., Sept. 10, 1896, 684–685.

Fluid Extracts—Alkaloidal Determination by Lloyd's Method.—A number of fluid extracts have been subjected to examination by Lloyd's method of alkaloidal standardization (see Proceedings 1891, 128) by students of the Philadelphia College of Pharmacy, with results that speak favorably for the method. William L. Mountain assayed six samples of

Fluid Extract of Tea, making four assays of each sample with fairly concordant results. The average yields of caffeine were: 0.80, 1.00, 1.05,

1.24, 1.31 and 1.43 per cent. respectively. William E. Weiss made assays (in duplicate) of eleven samples of

Fluid Extract of Coffee.—The results show that, like the fluid extract of tea, the commercial products are of poor quality, the percentage being 0.14, 0.24, 0.28, 0.30, 0.46, 0.54, 0.54, 0.74, 0.74, 0.82 and 0.88 of caffeine. Two samples of fluid extract of roasted coffee were also assayed. They contained 0.27 and 0.38 per cent. of alkaloid.

Fluid Extract of Guarana was assayed by Edythe Weston in eight samples, the assays also being made in duplicate. The preparation usually yielded from 2.02 to 3.50 per cent. of caffeine, but in one exceptional case 5.97 per cent. Incidentally the author determined the applicability of the method to the assay of powdered drug, it being necessary, however, in this case to remove the fatty matter extracted by the chloroform. The chloroform residue having been weighed and determined, it was treated with acidulated water to remove the caffeine; the residue fat was then dried to constant weight, and this, deducted from the original weight of chloroform residue, gave the weight of pure caffeine.

Fluid Extract of Kola, assayed by Otis Q. Schaeffer, showed 1.41, 1.35 and 0.80 per cent. of alkaloid. Some wines, cordials and elixirs were also assayed, and showed considerable variation in their alkaloidal strength; in the case of wines from 0.11 to 0.85 per cent.—Amer. Jour. Pharm., Oct., 1896, 535–537.

Fluid Extracts—Formulas for Palatable Preparations.—Frank Edel communicates the following formulas:

Aromatic Fluid Extract of Yerba Santa.—Take of fl. ext. yerba santa, fl. oz. 2; oil cloves, gtt. 32; oil orange, gtt. 16; oil sassafras, gtt. 16; alcohol, fl. oz. 3; liquor potassæ, fl. dr. 12; fl. ext. cardamom comp., fl. dr. 4; water, fl. oz. 4; glycerin, purified talcum, of each a sufficient quantity. The fluid extracts and oils are mixed, the solution of potassa and water added, then some talcum, and finally the alcohol, when the mixture is filtered, returning the first filtrate until it passes clear. Sufficient glycerin is then added to the filtrate to make 1 pint. The preparation is readily miscible with water, elixirs, or syrups. This fluid extract (so-called—Rep.) is intended for making a very palatable Aromatic Syrup of Yerba Santa, which see under "Syrupi."

Sweet Fluid Extract of Buckthorn is made as follows: Fld. extr. buckthorn, fl. oz. 16; liquor potassæ, dr. 1; solution of licorice (N. F.), fl. oz. 2; saccharin, dr. 1. Take 3 fluid ounces of the fluid extract, reduce by evaporation to admit (? Rep.) ½ ounce, dissolve in the rest of the fluid extract, add the solution of potassa, saccharin, and licorice. The resulting product is a pleasant, lasting, sweet fluid extract. The author also proposes the following formula for

Bitterless Aromatic Fluid Extract of Cascara Sagrada, which is a

modification of the formula recommended by L. F. Stevens several years ago. Moisten a mixture of 1 pound of cascara sagrada and 1½ ozs. of calcined magnesia with water, and set aside for 48 hours. Then pack in percolator, pour on 12 fl. ozs. of alcohol, and let stand, well covered, for 12 hours. Percolate with dilute alcohol until exhausted, reserving the first 12 fluidounces of percolate passing. Recover the alcohol from the second portion of the percolate, evaporate to the consistence of a soft extract; dissolve this in the reverse percolate and add the following ingredients: solution of licorice, N. F., 2 fl. ozs.; glycerin, 2 fl. ozs.; saccharin, 30 grains; oil of fennel, 10 drops. The product is superior to the preparation of the National Formulary.—West. Drug., Sept., 1896, 391.

Aromatic Fluid Extract of Cascara—Palatable Preparation by the Use of Lime.—Leo C. Urban, referring to Mr. Gilpin's process for the preparation of bitterless cascara (see Proceedings 1896, 421), and to the N. F. formula for aromatic fluid extract of cascara, in both of which, as well as in most other formulas, calcined magnesia is employed to deprive the bark of its bitterness, suggests that the same result is obtained by the use of freshly slaked lime at a proportionately lower cost. To make the aromatic fluid extract, 1000 gm. of cascara sagrada, 150 gm. of licorice root, and 100 gm. of freshly slaked lime are kneaded with 1000 Cc. of water, allowed to stand for ten or twelve hours, and then dried at between 40° and 50° C. The dry substance is then moistened with 400 Cc. of a menstruum composed of 500 Cc. of alcohol, 250 Cc. of glycerin, and 250 Cc. of water, packed in the percolator and percolated with the remainder of this menstruum followed by sufficient water to extract the drug. The first 850 Cc. of the percolate are reserved; the exhaust percolate is evaporated to a syrupy consistence, added to the reserve together with the aromatics—say 12 Cc. of compound spirit of orange—and lastly brought to the measure of 1000 Cc. by the addition of sufficient diluted alcohol. The resulting preparation is very palatable and possesses the cathartic properties of cascara in a marked degree.—Pharm. Rev., Dec., 1896, 270.

Liquid Extract of Bael, B.P.—Modification of Formula.—In accordance with his criticism on the active component of Indian bael (which see under "Materia Medica"), A. C. Abraham recommends the following formula for preparing an efficient liquid extract in which the pulp, regarded by him as the principal active component of bael fruit, is retained, instead of being carefully eliminated, as will result when the official formula is strictly followed. Pass sixteen pounds bael through a coarse cane sieve (say ⅜ inch holes), macerate all day in eight gallons distilled water, and at night put in flannel bags. In the morning again mix with eight gallons distilled water, and in two hours return to bags previously washed. Repeat this at night. Evaporate, *secundum artem*, in a water-bath or in vacuo at a still lower temperature, to fourteen pounds; cool, make up to 208 fluidounces. Add 48 fluidounces of rectified spirit gradually, and label "shake the

bottle." This is essentially the formula of the present B. P., with the doubtful points specifically cleared up, and the product will be found to keep well, to be pleasant to take, and, the author believes, thoroughly active. The liquid extracts of bael of commerce are always bright and of low sp. gr., as is also the preparation made by the B. P. process. Made by the author's process, it is not clear, but has a higher sp. gr.; these distinctions being shown in a table.—Yearbook of Pharm., 1896, 348–351.

Fluid Ext. Cimicifuga—Variation of Commercial Samples.—The Committee on Adulteration of the Ohio State Pharmaceutical Association reports on the examination of five commercial samples of fluid extract of cimicifuga, and only found one of them of apparent official (U. S. P.) quality, this sample being evidently made with strong alcohol as required by the Pharmacopœia. It contains 85 per cent. alcohol, whereas the other samples contained respectively 62, 57, 57 and 31 per cent. by volume. The preparations made with the weaker menstruum are characterized by their thicker consistence and deeper color; these conditions in part arousing the suspicion of the committee that they had not been made in accordance with the official requirement.—Proc. Ohio State Pharm. Assoc., 1896, 21.

Fluid Ext. Coca—Assay of Commercial Samples.—Kingsley C. T. Schneider has assayed eight fluid extracts of coca. Under identical conditions he obtained 0.535, 0.485, 0.675, 0.655, 0.625, 0.370, 0.335 and 0.675 per cent. of alkaloid, by the process of Lloyd (see Proceedings 1891, 128), which he found to give the best results of any tried. In order to remove the green coloring matter which is separated along with the alkaloid by the chloroform, the crude alkaloid was treated with acidulatep water, and the acidulated aqueous solution, after addition of ammonia to alkalinity, again shaken out with chloroform. The figures obtained indicate the difference in the strength of this fluid extract as found in the market of the U. S.—Amer. Jour. Pharm., Nov., 1896, 609.

Fluid Ext. Rose—Preparation.—Wm. C. Alpers expresses the opinion that if fluid extract of rose is retained by the U. S. P., it should be made by the process of repercolation. The evaporation of the second portion not alone deprives the preparation of a portion of the volatile oil, but it imparts to it an unpleasant odor which is absent in a fluid extract made by repercolation.—Amer. Drugg., Dec. 21, 1896, 384.

Flavoring Extract of Celery—Improved Formula.—Frederick Lester has prepared a very satisfactory flavoring extract of celery by the use of oil of celery, distilled from the fresh plant, and now marketed by a prominent manufacturer of essential oils: Oil of celery (fresh plant), 1 dr.; fluid extract of celery seed, 1 oz.; deodorized alcohol, 32 ozs. This serves a useful purpose at the soda fountain, etc.—West. Drug., July, 1896, 298.

Sambucium—An Alcoholic Fluid Extract of Elder Bark.—Prof.

Lemeine recommends an alcoholic fluid extract of the bark of *sambucus nigra* as a valuable diuretic, and introduces it under the name "sambucium."—Zeitschr. Oest. Apoth. Ver., Aug. 10, 1896, 600.

Liquid Malt Extracts—Examination of Certain Kinds.—Louis Emanuel, in reply to a query, communicates the results of an examination of a number of malt extracts, which have been claimed by some to be nothing more than strong beer. The following table shows the results obtained with six samples of the most popular malt extracts, a sample of beer, and an infusion of malt:

	Sample.	Sp. Gr.	Alcohol Per cent.	Extractive Per cent.	Diastatic Power.
1	Liquid Malt Extract	1.046	2.5	13.	None.
2	do	1.042	3.5	11.	"
3	do	1.030	6.0	10.5	"
4	do	1.038	1.75	8.	"
5	do	1.045	3.5	13.5	"
6	do	1.064	1.75	19.	"
7	Infusion of Malt	....	....	10.	30 minutes.
8	Beer	1.016	3.5	5.	None.

The diastatic power was determined by subjecting 5 Cc. of a 1 per cent. mucilage of potato starch mixed with 90 Cc. of water at 55° C. to the action of 5 Cc. of the malt preparation, maintaining the temperature at 55° C. for five hours. Confirmatory tests were made by the method of Dunstan and Dimmock. The presence of alcohol and the absence of diastase very plainly point out the class of beverages into which these liquid malt extracts may be properly placed.—Proc. Penna. Pharm. Assoc., 1896, 123, 124.

GLYCERITÆ.

Glycerinum Amyli, B. P.—Addition of Tragacanth to Secure Homogeneity.—John Henry Pearson has found that glycerinum amyli, prepared according to the instruction of the B. P., separated after a time some of the glycerin and water from its mass. He has invariably used wheat starch for its preparation, the B. P. admitting the use of either wheat, maize, or rice starch, without indicating which is the preferable. He finds, however, that the addition of 1 grain of powdered tragacanth per ounce of finished product will remedy this defect, the mass remaining homogeneous and inseparable with such addition.—Pharm. Journ., March 6, 1897, 201.

Glycerite of Licorice—A New Preparation.—Joseph W. England recommends "glycerite of licorice" as possessing in an elegant form all the desirable properties of licorice and none of the objectionable properties of the usual preparations. It is prepared as follows: Eight troy ounces of powdered extract of licorice are sifted upon a mixture of 32 fluidounces of

water and 1 fluidounce of ammonia water contained in a capacious agate-ware pan, dissolved as far as possible, and the mixture caused to percolate through a specially prepared "sand bed," the percolation being continued with water until the soluble matter in the bed has been practically washed out. The volume of the mixed percolate being noted, a measured quantity is evaporated to constant weight, and the amount of dry extract thus ascertained. The whole of the liquid is then carefully evaporated on a sand bath to such volume that 240 grains shall be contained in each six fluid drachms; 2 fluid drachms of glycerin being finally added for each such portion, so that a preparation will result containing 240 grs. of the purified extract in a fluidounce. The "sand bed" for the above quantities is prepared by placing a flat piece of absorbent cotton, wetted on the under side, in the bottom of a half-gallon glass funnel and filling the funnel to within an inch of the top with fairly coarse washed bar sand. This should be sifted, to remove sticks, stone, etc., thoroughly washed with boiling water and dried by strong heat. The gelatinous layer that forms when the first licorice solution has passed, may best be removed before continuing the washing or percolation with water.—Amer. Jour. Pharm., Dec., 1896, 663–666.

INFUSA ET DECOCTA.

Conc. Compound Decoction of Aloes—Preparation.—J. F. Brown says that to achieve a compound decoction of aloes which shall possess in the highest possible degree the medicinal properties of its constituents, overcooking must be avoided. He prepares a concentrated decoction, which keeps for a reasonable time unchanged, using in place of the extract—which would have to be made by evaporating an infusion of aloes to dryness—double the amount of crude aloes, as follows: Stir well together 2 oz. finest red Socotrine aloes, ½ oz. saffron, and 1 pint boiling water; let stand for twelve hours, strain, and add to the strained infusion 6 oz. (by weight) of glucose syrup (which see under "Syrupi"). Evaporate on a water-bath to 9½ fluidounces. Rub together ½ oz. each of coarsely powdered myrrh (select) and potassium carbonate, and add by degrees 8 fluidounces of liquid extract of liquorice. Let it stand for twelve hours, strain, mix with the solution of aloes, add 7½ fluidounces of concentrated compound tincture of cardamom, and sufficient water, if required, to make 25 fluidounces. The concentrated tincture of cardamom is made by percolating four times the quantity of spices ordered in the B. P. with proof spirit, omitting the raisins, the fruit sugar of which is replaced by the glucose syrup directed in the foregoing. Diluted with 3 times its volume of water, this preparation represents adequately in strength, and almost exactly in flavor, the recent decoction.—Chem. and Drugg., Sept. 12, 1896, 425.

Infusions.—Preservation by means of *Formaldehyde*, which see under "Organic Chemistry."

Infusion of Digitalis—Improved Process.—Dr. G. L. Humphreys observes that infusion of digitalis may be improved in appearance, taste, and acceptability by the following modification of the official formula: Digitalis, bruised, 15 Gm.; cinnamon, powdered, 8 Gm.; alcohol, 100 Cc.; cinnamon water, 150 Cc.; boiling water, 500 Cc.; cold water, a sufficient quantity to make 1,000 Cc. Upon the digitalis and *powdered* cinnamon contained in a suitable vessel, pour the boiling water and allow it to macerate until the mixture is cold. Then strain, add the alcohol and cinnamon water to the strained liquid, and pass enough cold water through the residue on the strainer to make the product measure 1,000 cubic centimeters; finally filter the whole through filtering paper, which has *not* been wetted, regardless of the ultimate quantity secured. Unless the last part of this process is carried out, the liquid will appear cloudy and show slight precipitation in a few days; but if filtered as directed it will appear of a rich port-wine color, and remain so indefinitely. The taste is so much modified that one can take it for months with but slight if any aversion. The author has himself been compelled to take this infusion in doses of one-half ounce night and morning for limited periods, and rarely found it to nauseate.—West. Drugg., April, 1897, 162.

LINIMENTA.

Camphor Liniment—Modification of Process.—Theo. D. Wetterstroem calls attention to camphor liniment when made by the official process, which directs the solution of the camphor in fully refined cotton-seed oil by the aid of heat, and the same when made with the "clarified cotton-seed oil" and without heat. The former is a very pale, almost water-white, liniment, and contained, in a given sample, only 14 per cent. of camphor, having lost some of the camphor by the heat employed during the solution; the cold-prepared sample has the rich yellow color of the commercial clarified oil, but retained all the camphor, viz., 20 per cent.—Western Drug., Feb., 1897, 68.

Oil of Amber Liniment—Formula.—Dr. Murrell recommends oil of amber, rubbed along the course of the spine, in the treatment of whooping cough. A liniment made as follows will be found useful: oil of amber, 6 drachms; oil of rosemary, 2 drachms; oil of origanum, 1 drachm; oil of turpentine, 1 ounce; linseed oil, to 4 ounces.—Chem. and Drugg., Aug. 22, 1895, 311.

Mercurialized Oil—Preparation.—Prof. Neisser recommends a mercurialized oil prepared by extinguishing 20 p. mercury with 5 p. anhydrous wool fat, and adding 15 p. liquid paraffin, so as to make a 50 per cent. preparation. This retains its fluidity, does not deposit metallic globules, and permits accurate dosage for injections.—Merck's Rep., Feb. 15, 1897, 113.

Chilblain Liniment—New Formula.—The "Pharm. Journ." (Nov. 28,

1896, 468) publishes the following formula for a chilblain liniment, with the request that records of experience with it are desirable for publication: Rub 2 drachms of soft soap with 3 fluidrachms of rose water; dissolve 1 drachm of camphor in 2 fluidounces of oil of cajuput; then gradually add this solution to the soap solution, and triturate until a creamy mixture results.

Magnesia Paste—A Useful Application to Burns.—Dr. Vergely recommends calcined magnesia, triturated with milk so as to form a paste, as an efficient application to burns both in the first and second stages. The paste is applied in thick layers and renewed several times a day.—Zeitschr. Oest. Apoth. Ver., Aug. 20, 1896, 620.

LIQUORES.

Solution of Glycyrrhizin—Substitute for Solution of Extract of Licorice, N. F.—Frank Edel recommends the following formula for making a solution of glycyrrhizin that will answer well as a substitute for the solution of licorice of the National Formulary, and is more conveniently made: Ammoniated glycyyrhizin, 1 oz.; water, sufficient to make 16 fl. ozs. Dissolve by the aid of heat.—West. Drug., Sept., 1896, 391.

Essence of Rennet—Speedy and Satisfactory Process of Preparation.—J. A. Forret recommends the following formula for preparing essence of rennet, which has the advantages that the preparation will pass through the filter within a reasonable time, producing a bright filtrate; will keep bright and sweet for a considerable time, and is devoid of a glairy or ropy consistence. As the stomachs vary in size and rennet value, three or more should be treated at a time. They should be dry and preserved with salt. For three stomachs use 15 ounces of salt, ¾ ounce boric acid, 15 ounces rectified spirit, and 150 ounces of water. Open the stomachs and retain as much of the salt as will adhere to the inner surface, cut into small pieces and macerate for about an hour, with frequent stirring, in fifty (50) ounces of water, in which five (5) ounces of salt is dissolved; strain through muslin and repeat the operation twice with the same quantity of water and salt. Dissolve the boric acid in the mixed liquors, add the spirit, and filter. Filtration is best accomplished by diffusing about an ounce of kaolin or precipitated chalk through the essence, and then pouring on a double filter, supported in a funnel or two, and previously moistened with water. The color may be brought up by the addition of a little saffron. The essence will keep well during a twelve-month, one drachm being sufficient for a pint of milk.—Year Book of Pharm., 1896, 357–358.

Solution of Lead Subacetate—Preparation without Boiling.—E. Claassen suggests that instead of boiling the mixture of lead acetate, lead oxide, and water, a much shorter as well as a more rational and economical way is to place the solids into a well-glazed stone jug, capable of holding a

little more than the desired quantity of the liquid, then to pour on them the hot water, and finally, to put the vessel in a warm place (on a stove), occasionally shaking until the sediment proves to be thoroughly white, which will occur in a short time. After cooling, the liquid is filtered into a graduated vessel, and diluted to the requisite volume under the usual direction.—Merck's Rep., July 1, 1896, 329.

Solution of Lead Subacetate—Preparation without Heat.—Edward M. Post communicates the result of some experiments made to determine the practicability of preparing solution of lead subacetate without heat. Such a method has been suggested by Hennig (1869) and Nerning (1870), and also in Squire's "Companion to the British Pharmacopœia," 16th ed. (1894), and if found practicable would seem to be a decided improvement over the official processes of both the U. S. and Br. Pharmacopœia, both of which require continued attention during the preparation. The author's recorded experiments have developed some interesting points. He finds it perfectly practicable to prepare a satisfactory solution by cold digestion of the ingredients for one day, and that prolonged digestion is of advantage. But neither by the process of cold digestion nor by the official process of boiling during half an hour, can a preparation be obtained containing the required 25 per cent. of lead subacetate when the U. S. P. proportions are used, whilst the proportion of the B. P. will under the same condition yield a solution containing from 29 to 30 per cent. By using 250 Gm. of lead acetate (instead of 170 Gm.), 147 Gm. of lead oxide (instead of 100 Gm.), and water to make 1000 Gm., a solution was obtained by cold digestion, which contained 26.9 per cent. of lead subacetate. It is apparent, therefore, that if the proper proportions are used a satisfactory product of full official strength may readily be obtained by cold digestion. Certain precautions must, however, be observed. The lead acetate should be dissolved in the greatest portion of the water, the lead oxide added, and the mixture agitated until the bright color, at first displayed by the oxide, has faded to a light yellow—a change usually effected in five minutes. The weight may then be brought up to that required, and the digestion continued during one or two days. If the precaution to agitation immediately after the addition of the oxide is not taken, a cake of that substance is liable to form and difficult to dislodge; while no such cake forms after the color of the oxide has faded. Incidentally the author has also examined some commercial samples of solution of lead subacetate. Only one sample contained the required 25 per cent., the others yielding the following percentages: 22.0, 21.5, 18.3, 15.9, 15.7 and 1.2 per cent.—Amer. Journ. Phar., Aug., 1896, 427–430.

Solution of Lead Subacetate—Cold Method of Preparation, etc.—Carl E. Smith noticed while adjusting a quantity of solution of lead subacetate to the U. S. P. standard, that there is a lack of agreement between the accepted specific gravity and the strength as determined by the volu-

metric method given. An investigation made revealed the following reasons for this discrepancy:

1. The specific gravity of a solution containing 25 per cent. of subacetate was found to be higher than that given in the Pharmacopœia, being 1.2485 at 15° instead of 1.195 (U. S. P., 1890) or 1.228 (U. S. P., 1880).

2. The official assay method gave unsatisfactory and misleading results. By a modification the accuracy was increased somewhat, but could not be made to approach that of the gravimetric methods.

3. The quantities of lead acetate and litharge, directed by the U. S. P. of 1890, were found insufficient to make a preparation of the full strength required, when materials of high grade were used and much care taken in the manipulations.

4. It was shown that the solution can be made in nearly as short a time without heat, as it can by boiling, and of as high a strength from the same quantities of materials.

These observations lead the author to suggest that preference be given the gravimetric method whenever an accurate adjustment is desired, and that the volumetric method, if retained, be carried out as follows:

Weigh about 4 Gm. in a 200 Cc. graduated flask. Add 80 Cc. of $\frac{N}{10}$ oxalic acid, fill to the mark with water and mix well. Let stand until clear, then separate 100 Cc. by means of a pipette or by filtration, and add to it 10 Cc. of diluted sulphuric acid. Heat the solution and titrate the excess of oxalic acid with $\frac{N}{10}$ potassium permanganate. About 4 Cc. will be required. 1 Cc. of $\frac{N}{10}$ oxalic acid = 0.013662 Gm. of subacetate of lead, $Pb(C_2H_3O_2)_2.PbO$.

Concerning the preparation by the *cold process*, the author observes that it is apparently necessary to keep the mixture agitated almost constantly until finished or nearly finished. But when this is done, the time required is remarkably short. When kept gently in motion just sufficient to prevent the litharge from aggregating into hard lumps, the product may be completed in 1 to 1½ hours. When this rule as to shaking is not observed, the litharge will "cake" and become covered with a coating of carbonate, which prevents further solvent action of the acetate. The solution is judged to be finished when no more reddish or yellowish particles of litharge are visible and the sediment is of a grayish-white color with perhaps some black particles of metallic lead. There was found to be no particular advantage in a very violent agitation. Solutions made in the way described were finished in nearly as short a time as others were by constant and very powerful agitation in a mechanical shaking apparatus.—Pharm. Rev., Nov. 1896, 250–251.

Liquor Iodi Compositus—Method of Examination and Commercial Quality.—Lugol's solution, in four commercial samples, has been examined by Richard Hal Compton, who found them to contain respectively 4.96, 4.82, 4.72 and 4.17 per cent. of free iodine, the U. S. P. requirement

being 5 per cent. While the Pharmacopœia does not give an assay process for the potassium iodide in this preparation, the author considers it important that this should be estimated as well as the free iodine. This is most conveniently done by first estimating the iodine according to the official method, then to titrate with decinormal silver nitrate to determine the total iodides, and deduct from the sum so ascertained the amount of iodide represented by the iodine determined in the official assay. Practical results can also be gotten by boiling the Lugol's solution, after dilution with water, until all the free iodine is expelled, then titrating with standard silver nitrate solution, which indicates at once the amount of potassium iodide in the sample.—Amer. Jour. Pharm., May, 1897, 242–243.

Liquor Auri et Arsenii Bromatus—Improved Process of Preparation.—Instead of the indirect process of preparing solution of bromide of gold and arsenic given in the "Extra Pharmacopœia" (Clemens solution, 192 minims; bromide of gold, 1½ grains; distilled water, sufficient for 1 fluidounce), R. Wright, in a paper read before the Brit. Pharm. Conference, suggests the following formula:

Place *40 grains* of arsenous acid and 40 grains of potassium carbonate, with *four ounces* of water, in a flask, and boil until solution is complete. Place *13.5 grains* of gold leaf in a wide-mouthed bottle, add *twelve ounces* of distilled water, then run in *100 grains* of bromine, and shake until the latter is dissolved. Add the solution previously made, shake a few seconds, transfer to a flask or retort, and boil until bromine vapors cease to be given off. Allow to cool, dilute with distilled water to 1 pint (Imp. Meas.—Rep.), and filter. The drawbacks to the indirect process are two-fold; the preparation of Clemens solution is necessary, and it is often difficult to obtain bromide of gold which will dissolve perfectly in water. The author's process, which he has used for some time, is simple, speedy, and economical; the ingredients required may be found ready at hand in almost any pharmacy; and the product is perfectly satisfactory.—Yearbook of Pharm., 1896, 353–355.

Solution of Mercuric Chloride—Convenient Form for Dispensing the Salt.—J. F. Brown finds it convenient to keep for ready use at the dispensing counter a solution of mercuric chloride containing 1 grain in 10 minims, prepared as follows: Place 96 grains of mercuric chloride, 1½ ounces (by weight) of glycerin, and 6 fluid drachms of distilled water into a flask, boil gently until solution is effected, cool, and make up the measure to 2 fluidounces with distilled water.—Chem. and Drugg., Sept. 12, 1896, 425.

Liquor Potassæ—Presence of Lead in Commercial Samples.—Wm. Geo. Stratton has examined thirty-six samples of liquor potassæ, procured from English and Irish pharmacies, for lead, with results shown in the following table:

Sample.	Percentage of KOH.	Percentage of Metallic Lead.	Sample.	Percentage of KOH.	Percentage of Metallic Lead.
No.			No.		
1	5.824	.057	19	2.524	Lead absent
2	4.768	.066	20	6.563	"
3	6.351	.060	21	6.395	"
4	5.273	.065	22	6.114	"
5	6.617	.005	23	6.058	"
6	6.665	.032	24	5.666	"
7	5.105	.004	25	5.824	"
8	7.180	Traces	26	6.507	"
9	4.768	.004	27	5.321	"
10	6.507	.003	28	6.665	"
11	4.544	.004	29	6.237	"
12	6.227	.006	30	6.665	"
13	6.058	.014	31	6.058	"
14	5.273	.002	32	5.497	"
15	6.563	.012	33	6.351	"
16	6.395	.045	34	6.563	"
17	4.768	Traces	35	6.788	"
18	7.349	Lead absent	36	6.273	"

The lead was determined as follows: To 20 Cc. of the solution acetic acid was added in excess; solution of potassium chromate was then poured in, and the resulting precipitate collected on counterpoised filter-papers, washed, dried for two hours in a water-oven at 100° C., allowed to cool under a desiccator, and finally weighed. In those cases where the quantity of lead was too minute for gravimetric determination, the amount of coloration produced by adding ammonium sulphydrate to a measured volume of the liquor was compared with that produced in a solution of lead of known strength, and the quantity present thus inferred. From the data obtained the amount of metallic lead present was calculated in the usual way. The author accounts for the presence of lead in these samples by the methods of manufacturers, who, according to rumor in the trade, are said to make this preparation by allowing lime, potassium carbonate and water to stand in lead-lined casks, occasionally stirring, until the conversion is complete.—Chem. and Drugg., May 1, 1897, 700.

Liquor Potassæ and Liquor Sodæ—Commercial Quality.—John P. Bates has examined six specimens of *liquor potassæ*, procured from wholesale houses. Three of these were colorless, the other three straw-colored. They contained respectively 3.18, 8.74, 4.10, 3.74, *0.018* and 4.38 per cent. of potassium hydrate, whereas the official requirement is about 5 per cent. With a single exception they all contained foreign matter; four of these contained carbonate, the alkalinity in the sample indicated as containing 0.018 per cent. of potassium hydrate being almost exclusively due to carbonate. Six samples of *liquor sodæ* purchased from manufacturing pharmacists were also examined. Three of these were colorless, the other

three were straw or yellow colored. Four of these contained carbonate, but only one contained foreign insoluble matter, while three gave evidence of the presence of potassium when subjected to the flame test. They contained the following percentages of sodium hydrate: 10.00, 4.47, 2.31, 5.25, 4.21 and 4.93 per cent. The Pharmacopœia requires about 5 per cent.—Amer. Jour. Pharm., May, 1897, 240–242.

Solution of Potassium Chlorate—Convenient Formula.—Harry B. Mason recommends for convenience at the prescription counter, a saturated solution of potassium chlorate prepared as follows: Pulverize 7½ drams of the salt in a mortar, gradually add water, warmed to about 150° F., to make 15 fluidounces of solution, and add finally 1 fluidounce of glycerin. The solution should measure 16 fluidounces when the temperature has been reduced to the normal. The addition of glycerin prevents deposition of crystals of potassium chlorate when the temperature falls below the normal.—Merck's Rep., June 15, 1897, 368.

MISTURÆ.

Bromoform Mixture—Efficient Formula.—Gay recommends the following formula for the efficient exhibition of bromoform: Bromoform, 1.5 (=45 drops); dissolve in oil of sweet almonds, 15.0; emulsify with gum arabic, 10.; simple syrup, 30.0, and distilled water, 65. grammes.—Zeitschr. Oest. Apoth. Ver., Jan. 20, 1897, 52.

Creosote Carbonate Mixture—Formula.—Harold Wyatt communicates the following efficient formula for the internal exhibition of creosotal or creosote carbonate: Creosotal, ℈iv; gum acacia, in powder, ʒiij; rum, ℥ss; syrup of tolu, ℥ss; water, to ℥iv. Melt the creosotal, pour it on the gum in a warm mortar, mix well, add the rum, and then the water, little by little, until an emulsion is formed. Make up to 3½ ounces with water, and lastly add the syrup of tolu.

Guaiacol Carbonate Mixture can be made similarly, using 3 drachms of syrup to rub down the guaiacol carbonate, and finely dividing it before adding the gum. The mortar need not be heated at all in this case.—Chem. and Drugg., Oct. 31, 1896, 643.

Oil of Amber Mixture—Formula for Whooping Cough.—Dr. Murrell recommends the following formula for an oil of amber mixture, which he has found useful in the treatment of whooping cough: Oil of amber, 10 ♏; powdered gum acacia, 1 drachm; syrup of orange flowers, ʒij; oil of anise, 3 ♏.; water, enough to make 1 ounce.—Chem. & Drugg., Aug. 22, 1896, 311.

Tooth Ache Remedies—Various Formulas.—The Chem. & Drugg." (Feb. 20, 1897), gives the following formulas for tooth-ache remedies, which may prove useful:

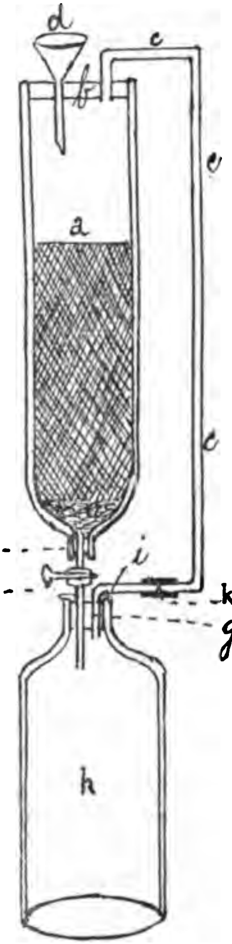
No. 1. Ol. caryoph., ℥ss.; acid. carbol. liq., ℥iij.; liq. cocci, q. s.; glycerini, ad ℥vj. M.

No. 2. Mastic, ℥ss.; tannin, ʒij.; camphor, ℥ss.; tinct. myrrh, ℥ss.; chloroform, ℥ss.; tincture of opium, ℥ss.; rectified spirit, ℥iij. Macerate for a week, shaking occasionally, and filter.

No. 3. Cocaine (alkaloid), gr.x.; extract of Indian hemp, gr.v.; tincture of aconite, ʒij.; spirit of chloroform, ʒij.; tincture of myrrh, ʒij. M.

These formulas all serve a good purpose in different forms of toothache. In each case, the hollow of the tooth should be dried by stuffing it with absorbent cotton, and immediately after the removal of this, a fresh piece of cotton, saturated with the remedy, should be inserted into the hollow. Before drying the hollow, the mouth should be washed out with cold water. While useful in most kinds of toothache, these remedies are not so in the persistent forms arising from inflammation at the roots, etc.

FIG. 43.



Oleo-Resin of Capsicum.

OLEO-RESINÆ.

Oleo-Resin of Capsicum—Preparation and Yield.—Wm. C. Alpers, having occasion to make a small quantity of oleo-resin of capsicum for experimental purposes, found the yield so much larger than that stated in text-books (16 per cent. instead of 5 per cent.) that he was induced to make it on a large scale. The percolator used for this purpose is shown by the accompanying cut (Fig. 43), and was constructed with the view to prevent loss of ether. The little funnel *d*, is removed after pouring on ether, the opening being closed by a cork, until it is necessary to pour on more ether. Mr. Alpers describes the process of percolation, and the distillation of the ether from the percolate, very circumstantially. The residue of distillation, instead of being strained as required by the U. S. P., was filtered through paper. From 5 lbs. of capsicum he obtained 15 oz. oleo-resin.—Merck's Rep., Nov. 15, 1896, 593.

PILULÆ.

Chocolate Coated Pills—Convenient and Practical Process.—According

to Schlicht, pills may be coated with the utmost elegance and uniformity in the following manner: Shake up the pills in a hollow globular vessel with gum arabic mucilage and powdered chocolate alternately, until they are covered to the desired thickness. Then shake them again in a similar receptacle of metal, or any ordinary tin box, one half of which has been slightly warmed, to give them the desired finish.—West. Drugg., May, 1897, 218; from Apoth. Ztg.

Pil. Ferri Carbonatis—Improved Formula.—L. A. Harding suggests the following formula for "pil. ferri carbonatis," which he considers an improvement upon the U. S. P. formula, giving uniform results and producing pills that will not crack, as the U. S. P. pill is sure to do: Ferrous sulphate, 16 gm.; potassium carbonate, 8 gm.; sugar, 4 gm.; powd. tragacanth, 2.5 gm.; powd. althæa, 3 gm.; glycerin, water, of each sufficient to form a mass, which is to be made and manipulated precisely as directed in the U. S. P.—Proc. Minn. State Pharm. Assoc., 1896, 117–118.

Blaud's Pills—A Subject for Investigation.—William B. Thompson observes that manufacturers honestly vie with one another in an endeavor to produce ferruginous (or Blaud's) pills in an exact condition, and in maintaining the composition in a state that shall, in all respects, fulfill their therapeutic purpose or intention. The great popularity of this pill among physicians justifies the inference that satisfactory results follow their use, notwithstanding the theoretical fact that in the composition and preparation of this pill all the laws of chemical action point to anything but uniformity in their composition. Indeed a physical examination, and the application of a color test to these various products of the manufactories, reveals so many conditions and appearances as to bewilder the judgment when claims to chemical accuracy are made. The author suggests examination of both the commercial and extemporaneous preparations for the purpose of ascertaining the precise character of the former, and of determining wherein they differed from the latter. He doubts the superior medicinal efficacy of ferrous carbonate over the other compounds of iron formed by the oxidation of this constituent, and he believes it timely to begin investigation on this side of the question.—Amer. Journ. Pharm., Jan., 1897, 17, 18.

PULVERES.

Granular Effervescent Potassium Bromide with Caffeine—Valuation of Commercial Samples.—Charles E. Alexander gives the details of a method for the valuation of granular effervescent potassium bromide with caffeine. The bromide is estimated as silver bromide, any silver chloride present in the latter being removed by treatment with ammonium carbonate. Incidentally, the amount of chlorides present in the sample may be determined by acidifying the ammonium carbonate solution with nitric acid, heating the mixture, collecting, washing, and weighing the precipitate so obtained.

The caffeine is estimated by making a mixture of 5 Gm. of the sample, 3 Gm. of official solution of ferric chloride, and enough (about 3.5 Gm.) sodium bicarbonate to alkaline reaction; the magma is then triturated thrice successively with chloroform (20, 10 and 10 Cc.), and the chloroformic solution is evaporated to constant weight. The author records the results of the examination of three samples of the compound as follows:

	Potassium bromide.	Caffeine.
1	17.43	.22
2	8.74	1.50
3	6.08	.36

Chlorides were present only in quantities allowed by the Pharmacopœia in the potassium bromide. The loss on drying the salts at 90° C. was from 1.0 to 1.2 per cent. The preparation of the N. F. should contain 11.1 per cent. potassium bromide and 1.11 per cent. caffeine.—Amer. Jour. Phar., Aug., 1896, 425, 426.

Laxative Powder—Formula Suitable for Children.—The following formula for a laxative powder for children is recommended in "Journ. de Méd. de Paris": Sodium bicarbonate, 3 drachms; powdered rhubarb, 2 ounces; sodium sulphate, 1 ounce; oil of peppermint, 20 minims. Half to one teaspoonful in the morning before breakfast.—Pharm. Journ., Aug. 22, 1896, 174.

RESINÆ.

Podophyllum Resin—Remarkable Difference in its Activity According to Process of Preparation.—Herman J. Lohmann states that when resin of podophyllum is prepared by the U. S. P. process—precipitation in acidulated water—a light brown powder results, whereas the Pharmacopœia allows this preparation to have a greenish-yellow or yellow-green color. He has therefore undertaken to inquire into the cause for this discrepancy, and is forced to the conclusion that the subject had not been thoroughly investigated. He prepared three specimens of the resin as follows:

No. 1. By precipitation in water only.

No. 2. By precipitation in acidulated water by the U. S. P. process.

No. 3. By precipitation in a solution of alum.

The resin obtained from 2 ounces of fluid extract by process No. 1 amounts to 10 grains; process No. 2 yielded from the same quantity 23 grains of resin, while process No. 3 yielded 35 grains. But the most remarkable difference is shown in the medicinal activity of these several products. It is not safe to give a larger dose than $\frac{1}{100}$th grain of the resin obtained by process No. 1; the product by process No. 2 may be given in doses of ¼ to ½ grain, while that obtained by process No. 3 can be given in doses of 1 to 1½ grains; and yet the author feels convinced, it is the latter, the yellowish-green or greenish-yellow alum product, which is usually found in our pharmacies.

It is well known that it takes several years of storage to develop the full percentage of resin, which is not found to any extent in the fresh drug. It is therefore a pertinent inquiry what substance is expected to be present in the fluid extract and tincture of podophyllum. Should it contain the active constituents—podophyllotoxin and podophyllinic acid—in the proportions in which they are present in the fresh drug, or should these preparations represent a maximum to quantity of podophyllum resin? In the latter event the U. S. P. ought to be specific in mentioning that the properly seasoned drug should be used.

The author also obtained precipitations from four fluid extracts, the products of different laboratories. From one-half ounce he obtained by the U. S. P. process of precipitation (No. 2) 23, 21, 20 and 20 grains of resin, while by the alum process (No. 3) he obtained 35, 34, 32 and 30 grains respectively.—Proc. N. J. Pharm. Assoc., 1896, 51–54.

SAPONES.

Transparent Glycerin Soaps—Composition.—L. A. Harding observes that by common consent all the transparent soaps of the market are called glycerin soaps, but that the designation is erroneous, for a great many of them do not contain any glycerin at all, save that produced in the saponification of the fats employed. Under any circumstances, when glycerin is added only small quantities are used, since large quantities render the soaps deliquescent and smeary. For a long time it was thought necessary to use glycerin and alcohol for the production of transparent soaps. These are now made by the use of sugar to give transparency, and carbonate of soda to give the requisite degree of firmness to the product. The finished product contains all the lye used, all the glycerin produced, and all the impurities possessed in the material.—Proc. Minn. State Pharm. Assoc., 1896, 116–117.

Soap Essences—Formulas.—The following formulas for "Soap Essences" are given in "Seifen. Ztg.:" White olive oil soap, 200; alcohol, 80°, 1000; potassium carbonate, 12. The soap is dissolved by gentle heat on a water bath, and the potassium carbonate added. It is then colored, possibly with safron or rosanilin, and perfumed. A good perfume is obtained by mixing tincture of vanilla, 10; tincture of orris, 20; extract of rose, 20; extract of orange flower, 50. The perfumed soap essence is allowed to stand in the cold several days, and filtered.

Rodiquet recommends other formulas: White soap, 1; alcohol, 85°, 3; distilled water, 1. For medicinal purposes, the following: Olive oil soap, 20; distilled water, 30; alcohol, 60°, 60; potash (? Rep.), 1; perfume, 1 per cent.—Ztschr. Oest. Apoth. Ver., Jan. 10, 1897, 31.

SPIRITUS.

Hoffman's Anodyne—Decrease in Demand.—Emile Ott endeavors to

answer the question whether it is true that the demand for Hoffman's anodyne has greatly decreased in recent years, and that various mixtures of ether and alcohol have taken its place. He observes that this question has undoubtedly arisen from the fact that in vicinities where foreign populations have spread themselves and are on the increase, the demand of each is for an article that is made without heavy oil of wine, and they complain when the U. S. P. article is supplied. In other localities the demand for the article free from heavy oil of wine (spiritus aetheris U. S. P. supplies this demand.—Rep.) is principally by the Germans and German-speaking people, and to such the pharmacist is perfectly justified in selling it in place of the U. S. P. spiritus aetheris compositus, which is the article usually demanded by Americans and always by American physicians when the contrary is not specified.—Proc. Penna. Pharm. Assoc., 1896, 109.

Spirit of Nitrous Ether—Assay.—Lawrence A. Kessler has carried out a number of experiments to confirm the value of the method proposed by Professor David Walker, for the rapid volumetric estimation of nitrous ether (see Proceedings, 1896, 441), which is based on the measurement of the iodine liberated from potassium iodide, through the decomposition of spirit of nitrous ether by the U. S. P. process of assay. He finds the method liable to give too high results on account of the liberation of iodine by the nitrogen tetroxide, as pointed out by Mr. MacEwan (Ibid., 442); the reaction going on from the time the materials are mixed, and even during the titration, so that iodine is being alternately liberated and titrated. The rapidity with which the volumetric solution of sodium thiosulphate is added, and also the quantity added at a time, therefore influences the amount required for decoloration, and the method is untrustworthy even under conditions or restrictions that may be proposed. Experiments made with the official U. S. P. method lead him to recommend it as reliable under two slight modifications. The one consists in rendering the spirit of nitrous ether alkaline by the addition of one-fifth its volume of alcoholic solution of potassium hydrate, the spirit, if acid, as is usual, otherwise reacting with the potassium iodide, and liberating nitrogen dioxide before the normal sulphuric acid is added. The second consists in the substitution of 20 Cc. of saturated alcoholic solution of potassium iodide for the 10 Cc. of aqueous solution required, thereby avoiding the formation of air-bubbles when the iodide solution is allowed to flow into the burette of the nitrometer used in the official process. With these conditions, the official U. S. P. method gives accurate and concordant results. The author mentions incidentally that the quality of spirit of nitrous ether dispensed is remarkably poor.—Amer. Jour. Pharm., June, 1897, 307–311.

Spirit of Nitrous Ether—Commercial Quality.—The Committee on Adulteration of the Ohio Pharmaceutical Association report on the examination of six samples of spirit of nitrous ether, and found them, with a

single exception, to be below the normal standard of the U. S. P., the exception again being one containing a larger percentage of nitrous ether than required.—Proc. Ohio State Pharm. Assoc., 1896, 21.

Spirit of Nitrous Ether—Preparation on the Manufacturer's Scale.—E. L. Patch, replying to some criticisms on the pharmacopœial process for making spirit of nitrous ether, to the effect that it is at fault in adopting processes and formulas that may prove faulty or even dangerous in the hands of the inexperienced or uneducated, while it does not give sufficient detail to enable such to examine, assay and standardize their goods, observes that this has force only as the critic considers its scope to be that of a text-book on pharmacy, chemistry and physics, as well as a standard of products and processes for the use of educated and trained pharmacists. He has made hundreds of pounds of nitrous ether by a process modified from the official, and has suffered no inconvenience or danger in its use. Using in his process 147 pounds of sodium nitrite (assaying 96 per cent.), dissolved in 30 gallons of water, 15 gallons of deodorized alcohol, 124 pounds of sulphuric acid in 30 gallons of water, and 6 pounds of sodium bicarbonate in 6 gallons of water, he obtained 129 pounds of ether assaying 94.03 per cent., or 83.8 per cent. of the theoretical yield based upon the possibilities of the sodium nitrite used. Concerning the latter. the author observes that there is a wide range in the value of sodium nitrite, ranging from 84 to 96 per cent. usually, while occasionally as low as 78 per cent. and as high as 99.89 per cent.—Amer. Drug., Aug. 10, 1896, 63.

Arom. Spirit of Ammonia—Preparation.—J. D. Persse believes that the troublesome precipitation sometimes observed in making aromatic spirit of ammonia, may be avoided by adding the alcoholic solution of the aromatic oils to the watery solution of ammonia. He regards the suggestion in the U. S. Dispensatory, 1894, that the carbonate of ammonia be left in contact with the aqua ammonia for seven or eight hours, before adding the other ingredients, a good one.—Proc. Georgia Pharm. Assoc., 1896, 47–48.

Bay Rum—Preparation at St. Thomas.—R. W. Elliot has witnessed the process of distilling bay rum as carried on by Mr. A. H. Riese, a pharmacist of St. Thomas, W. I. It consists in placing a quantity of bay leaves in a copper still, adding some St. Croix rum, and distilling off the product; the process is then repeated by redistilling the distillate with a fresh portion of leaves, so as to completely impregnate the rum with volatile oil. As a result of this double distillation, the rum loses much of its amylic constituents, but retains the ethyl acetate, and a delightful and refreshingly fragrant product is produced, which an artificial compound can only basely imitate. The editor of "Chem. and Drugg." adds that he had information from Mr. Riese several years ago that he uses the berries as well as the leaves of *Myrcia acris*, and that the peculiar fragrance of St. Thomas bay

rum is largely due to this addition.—Chemist and Drugg., July 25, 1896, 147; from Can. Pharm. Journ.

Bay Rum—New Formula.—The "Pharm. Journ" (Nov. 28, 1896, 468) publishes the following formula for bay rum with the request that records of experience with this formula be communicated to that journal: Mix together 1 drachm of oil of myrcia acris, 10 minims of oil of sweet orange, 10 minims of acetic ether, 1 ounce of rum; dissolve in 8 ounces of rectified spirit, add 8 ounces of orange-flower water and 2 minims of burned sugar, stir in about a drachm of finely-powdered pumice stone, throw upon a filter, and filter bright.

Eau de Cologne—Old Formula.—The following formula for cologne water, published in 1823 in a book called "Five Thousand Receipts" is communicated by E. Andrews to "Chem. and Drug." (July 25, 1896): Take of essence de bergamoth, 3 ozs.; neroli, 1½ drachms; cedrat, 2 drachms; lemon, 3 drachms; oil of rosemary, 1 drachm; spirit of wine, 12 lbs.; spirit of rosemary, 3½ lbs.; eau de melisse des carmes, 2½ lbs. Mix, distil in *balneum mariæ* (salt water bath), and keep in a cold cellar or ice house for some time. The

Eau de Melisse des Carmes is made as follows: Take of dried balm leaves, 4 ozs.; dried lemon peel, 2 ozs.; nutmeg, coriander, of each 1 oz.; cloves, cinnamon, dried angelica root, of each 4 drachms; spirit of wine, brandy, of each 2 pounds. Steep, and distil in *balneum mariæ;* re-distil, and keep for some time in a cold cellar.

Lavender Water—A Good Formula.—The following formula for "Aqua Lavand. Opt." is given in Chem. and Drugg. (April 17, 1897, 620): Ol. lavand. ang. opt., ℥ij.; ol. bergamot. super., ʒvj.; ol. amygd. amar., mv.; ol. santal. flav. angl., ʒss.: otto rosæ, ʒss.; ess. moschi, ʒvj.; ess. ambergris, ʒvj.; ess. rosæ super. opt., ℥iv.; sp. vin. rect. (58 per cent.), Oiiiss. Macerate four weeks.

SUCCI.

Medicinal Juices—Alkaloidal Strength.—The attention of E. H. Farr and R. Wright having been drawn to the official (B. P.) Succi by an examination of some succus conii, which had been found practically inert, they extended their examination to the juices of belladonna, conium, hyoscyamus and scoparius, in six samples of each, with the result given in the table. The alkaloids from succus conii and succus scoparii were weighed as hydrochlorides.

Succus.	1.	2.	3.	4.	5.	6.	Average.	Average Commercial Tincture.
Belladonnæ	.032	.025	.010	.034	.050	....	.030	.010
Conii	.012	.015	.032	.012	.062	.030	.027	.043
Hyoscyami	.005	.006	.005	.004	.006	....	.005	.010
Scoparii..........	.112	.212	.114	.172	.184	.178	.162	....

The general process followed for the determination of the alkaloids has been printed in "Pharm. Journ" (3) xxi, 859. The conclusions arrived at from the foregoing results are that the vegetable juices are exceedingly variable in degree of potency, and that such uncertain remedies should be discontinued.—Yearbook of Pharm., 1896, 292–295.

Fruit Juices—Influence of Air Upon the Red Pigment and Flavor.—According to A. Rosenstiehl, the exclusion of air is necessary for preserving the red color of the grape and of other fruits. Musts preserved from contact with the air retain the agreeable taste of fresh grapes. The red coloring matter of the skins of the grape and of other fruits is soluble in the unfermented juice. The action of the air renders the coloring matter insoluble. It is one of the causes of the boiled taste. We may make preserves of musts, possessing the color, the flavor, and the aroma of the fresh fruit.—Chem. News, April 9, 1897, 179; from Compt. rend., Mar. 15, 1897.

Fruit Juices—Determination of Artificial Colors.—The "Zeitschr. Oest. Apoth. Ver." (Nov. 20, 1896, 866), publishes the following simple method for determining whether a fruit juice—raspberry, blueberry, strawberry, etc. is artificially colored: The juice is diluted with twice its volume of water, an excess of solution of basic lead acetate is added, and the mixture filtered through a dry filter. In the absence of artificial color, the filtrate passes colorless. Aniline colors are retained in the filtrate.

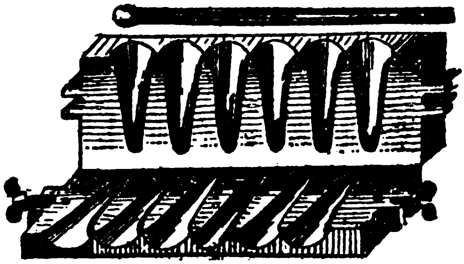
SUPPOSITORIA.

New Suppository Mould—Simple Construction.—A simple mould for making suppositories by pressure, made by Liebau (Chemnitz) is shown by Fig. 44. The mould is metal, nickel plated, has a center pin and screw clamp at each end, and accommodates any size of suppository up to 120 grains. The cacao-butter mass is introduced in weighed quantity into each division of the mould and firmly pressed, first with a small and afterwards with a large plug.—Pharm. Journ., Oct. 24, 1896, 374.

Suppositories—Superiority of Agar-Agar over other Bases, and Preparation.—Prof. Lewin considers it essential that the medication should be equally distributed in the suppository, and that it should be readily separable from the basis. The suppository itself should be as sterile as

possible, and so formed as to be easily inserted, a special point being that the dosage of medicament should be exact. He has made experiments in conjunction with Eschbaum, and they have come to conclusions which are briefly given in the following:

FIG. 44.



New Suppository Mould.

Cacao Butter Suppositories only allow of an equal distribution of the prescribed drugs if the mass is mixed with fat or oil and subsequently rolled out. If made by melting and moulding, the medicament is invariably unequally distributed, and the greater part of the dose is usually found at the tip of the suppository.

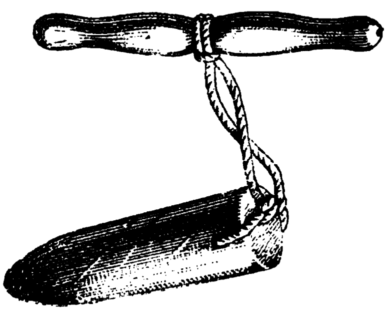
Glycerin-Gelatin Suppositories are in some respects vastly superior to those prepared with cacao butter, for the medicament can be dissolved and even distribution throughout the mass thus secured. They can be introduced into the rectum without loss, are quickly dissolved and speedily absorbed. But they are not always sterile; the gelatin may contain ingredients injurious to the human organism, and the glycerin may prove irritating to the rectum. The authors reject these also and recommend

Agar-Agar Suppositories as superior to any other, if prepared under the following precautions and directions: One part of commercial agar powder is heated with twenty-nine parts of water for some minutes in the vapor bath, the resulting mixture being easily poured out and settling after a little time to a slippery, tough and flexible mass, which has an acid reaction. This is neutralized by adding 0.1 gramme of sodium bicarbonate to 10 grammes of the powdered agar. In practice, these proportions of agar powder, sodium bicarbonate and water, are placed into a small medicine bottle with the quantity of medicament suitable for a certain number of suppositories. The whole is then well shaken, the stopper of the bottle is well tied down, and the bottle placed into boiling water for five to ten minutes. None of the many bottles used by the authors cracked in this process. Square pieces of paraffined paper (about 4 Cm.) are rolled into pointed paper bags, the points turned over, and the bags fixed in a suitable frame on a scale-pan. The respective quantities of the hot agar mass are then weighed carefully into the paper bags, and the suppositories are

preserved for use in the bags.—Phar. Journ., May 15, 1897, 411; from D. Med. Wochenschr.

Glycerin Suppository—A Novel Attachment.—Dr. Overlach, in discussing the action of glycerin suppositories, observes that the occasional failure to obtain satisfactory results from the use of glycerin suppositories is frequently due to the escape of the suppository so far into the rectum as to lose a large measure of its efficacy. When the suppository penetrates too far, the walls are so wide apart that it comes into contact with but one wall, while the walls further up are not nearly so sensitive as just over the sphincter. Moreover, when the suppository is retained lower down, there is a mechanical irritation, caused by the presence of the suppository, which is a factor in the promotion of the action of the bowels. In order to retain the suppository at the proper place in the rectum, Dr. Overlach suggests that a little string be fastened to the base of the suppository and that at the other end of the string a cross piece be attached, as shown in the accompanying engraving, Fig. 45. The device is patented in Germany.—Amer. Drug., June 10, 1897, 315; from Reich. Med., Aug., 1897, No. 8.

FIG. 45.



Ichthyol Suppositories—Preparation.—To make firm suppositories containing ichthyol, it is recommended in "Merck's Report" (March 15, 1897, 177) to melt together equal parts of cacao butter and wax, and to add the ichthyol to the half-cooled mass. A soft, easily-liquefying suppository is obtained if the wax is omitted, the cacao butter and ichthyol being simply beaten together to form a mass.

Gelatin Bougies—Formula for Mass.—Fernand Borjeldieu recommends the following formula for a gelatin mass whose ready melting makes it an excellent substance for vaginal dressings, far surpassing the other gelatin compounds usually employed for this purpose, since they are but little liquefiable: Gelatin, 12 parts; water, 40 parts; glycerin, 90 parts. Merck's Rep., May 15, 1897, 312; from Bull. Comm., xxv., 81.

SYRUPI.

Syrup—Convenient Preparation for Soda Fountain.—R. H. Venable has found the following method of preparing syrup for the soda fountain very satisfactory. Using the "Favorite" revolving churn, of 5 gal. capacity, he introduces the necessary quantity of ingredients for the syrup in the following proportions: Best granulated sugar, 10 pounds; distilled water, 1 gal.; gelatin, dissolved in warm water, ¼ oz. By the aid of the

churn he can make 5 gallons of syrup in 20 minutes, and when made in this way it seems to be just right; it mixes well with all kinds of fruit juices or ice cream.—Merck's Report, Sept. 15, 1896, 481.

Rock Candy Syrup—Superiority and Quality.—Emile Ott has investigated the claims of the manufacturers of rock candy syrup concerning its superiority and cheapness. While the claim is in some respects a good one, the best grades of rock candy syrup being pure, unfermentable and denser than the official syrup, the author thinks that with a proper apparatus for making syrup by cold percolation, an equally good syrup can be obtained cheaper.—Proceedings Penna. Pharm. Assoc., 1896, 109.

S. H. Hill, at the same meeting, briefly recommends rock candy syrup as being preferable to syrup made from sugar.—Ibid., p. 121.

Glucose Syrup—A Good Pill Excipient and Vehicle.—J. F. Brown recommends glucose syrup, made by mixing 12 parts liquid glucose, 3 parts glycerin, and 1 part of water—all by weight—as being an admirable excipient for pills and useful as a vehicle and diluent.—Chem. and Drugg., Sept. 12, 1896, 425.

Medicinal Syrups—New Formulas.—Wm. Webber recommends the following formulas for medicinal syrups, which he believes will prove useful additions to the U. S. Pharmacopœia:

Syrupus Cinnamomi. In place of the formula of the Germ. Phar., which has been practically adopted in the National Formulary, the author recommends the simple admixture of 1 part tincture of cinnamon and 5 parts simple syrup, which produces, in his opinion, a syrup that is superior to the syrup made by the Germ. Phar. process. With this syrup a very palatable and efficient

Syrupus Rhamni Purshianæ may be made as follows: Fluid ext. cascara, 4 ozs.; syrup. cinnamon, 12 ozs.; or 4 ozs. of the syrup of cinnamon may be replaced by 4 ozs. of syrup of orange.

Syrupus Eriodictyi prepared by the following formula is a beautiful orange colored preparation and has a pleasant taste: Mix together 1 oz. magnesium carbonate and 2 ozs. of fluid extract of yerba santa, then add 6 ozs. of water, filter, and bring the filtrate to 8 ozs. In this dissolve 14 ozs. of sugar by gentle heat and strain.

Syrupus Chloroformi, an efficient and agreeable adjunct to cough mixtures, may be made by adding 1 oz. of spirit of chloroform to 15 ozs. of syrup, so as to make 1 pint.

Syrupus Aurantii. In place of the complicated process and manipulation directed in the U. S. P., the author recommends the following simple process: Macerate 1 p. of fresh orange peel as specified by the U. S. P. with 5 p. of alcohol for a few days. Of this tincture add 2 ozs. to 14 ozs. of syrup to make 1 pint. This, while not representing quite as much of

the peel as is ordered in the Pharmacopœia, has a very delicate flavor and is very satisfactory.—Amer. Drug., May 10, 1897, 255.

Syrupus Eriodictyi Arom.—Improved Formula.—George Hater states that on account of its alkalinity the syrup of yerba santa of the N. F. has not been satisfactory in his hands. He has made a number of experiments, and as a result recommends the following formula, which excels in its properties of masking the taste of quinine: Infuse 240 grains of yerba santa (No. 30 powder), 240 grains crushed licorice root, and 120 grains of crushed white oak bark, with 8 ozs. of boiling water; allow to stand 24 hours, then filter through double filter. Receive 7 ounces of filtrate, to which add 12 ozs. (Troy) of sugar, 2 drops of oil of lemon, 4 drops of oil of cloves, 2 drops of oil of sassafras, and 1 fluid ounce of glycerin. Mix well together, and, if necessary, make up to 16 fluid ounces with water.—Proc. Ills. Pharm. Assoc., 1896, 84.

Syrup of Krameria, U. S. P., 1890—Cause of Turbidity.—Emile Ott gives the result of his experience in the preparation of syrup of krameria by the formula of the U. S. P., 1890. He finds that if the fluid extract of the Ph. 1890 is used, the preparation is turbid, whereas, if the fluid extract of 1880 is used, a clear preparation is obtained.*—Proc. Penna. Pharm. Assoc., 1896, 110.

Syrup of Tolu—Improvement of the Belgian Pharm. Process.—Hendrix proposes the following as an improvement of the process of the Belgian Pharmacopœia: 10 parts of balsam of tolu are distilled with 150 parts of water until one-third has distilled over; the heating of the remainder in the still is then continued for a few minutes under constant stirring, so as to bring all the melted balsam into contact with the water, and the liquid is filtered while hot. This filtrate is mixed with the distillate, and 260 parts of sugar added, the final weight being adjusted to 400 parts.—Pharm. Journ., Dec. 26, 1896, 546; from Annales de Pharm. II., 473.

Syrup of Tolu—Rapid and Efficient Method of Preparation.—Harold Wyatt recommends the following as being a rapid way of preparing syrup of tolu, and furnishing a syrup superior to the product of the B. P. formula: The balsam is powdered in a mortar, and then rubbed with four times its weight of well-washed coarse sand heated so that the hand can just bear the heat. The sand becomes coated with the tolu, and the powder so formed is readily extracted by successive portions of water at about 120° to 140° F., in which the sugar is afterwards dissolved with as little heat as possible.—Chem. and Drugg., Oct. 31, 1896, 643.

Strawberry Syrup—Formula and Process.—The following formula for strawberry syrup is recommended in "Ztsch. f. Kohlens. Ind.": 1000 gm.

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* In the formula of the U. S. P., 1880, 20 parts of glycerin was directed for 100 parts of fluid extract. In the 1890 formula 100 Cc. only are used for 1,000 Cc. of fluid extract. Rep.

sugar are boiled with 600 gm. distilled water, clarified, completely skimmed, and, after adding 5 gm. citric acid, boiled down to 1250 gm. Then 500 gm. of whole fresh *wild* strawberries are gradually stirred into the syrup, and the mixture, well covered, is digested during three hours on the steam apparatus. The syrup is strained through flannel, observing care not to mash the berries, and when cold is filled into dry bottles and preserved in a cool place.—Zeitschr. Oest. Apoth. Ver., Aug. 20, 1896, 619.

Syrup of Mulberries—Improved Process.—Hendrix proposes the following improvement on the process of the Belgian Pharmacopœia for syrup of mulberries: The weighed mulberries are heated gently with constant stirring. When the juice commences to boil it is strained, and to the clear juice sugar is added in the proportion of 19 parts for 16 of mulberries. The usual process is then followed, the density of the final product being adjusted to 1.34.—Pharm. Journ., Dec. 26, 1896, 546; from Annales de Pharm., II., 472.

Syrup of Hydriodic Acid—Cause of Discoloration and Remedy.—Donald Cameron has made various experiments to overcome the discoloration of syrup of hydriodic acid and to ascertain its cause. He finds the cause to be the oxidation of the sugar, and the remedy to digest it with a little powdered animal charcoal and filtering, when it will apparently remain colorless indefinitely.—Proc. N. J. Pharm. Assoc., 1896, 49–51.

Syrup of Hypophosphites, Compound, N. F.—Suggestion of Improvement.—H. J. Lohmann observes that the compound syrup of hypophosphites of the N. F. eventually deposits a heavy precipitate which becomes scaly. He attributes this to the presence of potassium citrate in the preparation, and advocates its replacement in the formula by hypophosphorous acid—2 drachms (to the pint? Rep.)—when the result will be far more satisfactory, and the syrup will be bright and clear, and remain so.—Proc. N. J. Pharm. Assoc., 1896, 54–55.

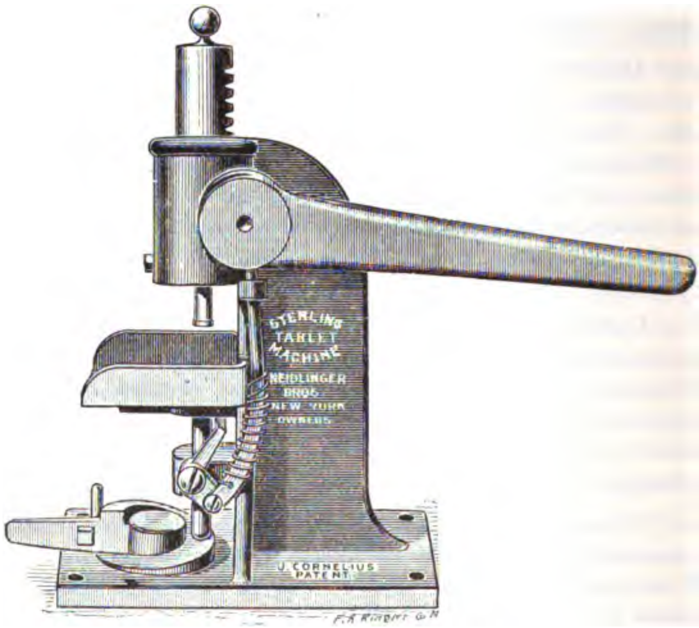
Syrup of Hypophosphites with Iron—Modified Manipulation.—Emile Ott observes that when syrup of hypophosphites is made as officially directed it yields a cloudy preparation. This can be avoided by dissolving the lactate of iron and potassium citrate in a little hot water, and adding the solution to the syrup; or their salts may be dissolved in hot syrup.—Proc. Penna. Pharm. Assoc., 1896, 111.

TABLETA.

Tablets—A Practical Machine for the Prescription Counter.—James Cornelius has devised and patented the tablet machine shown by Fig. 46, which is put upon the market by Neidlinger Bros., of New York. The machine is stated to be comparatively inexpensive, while its working parts are of the finest steel and interchangeable. Each machine is supplied with two sets of moulds and plungers, making tablets respectively of 5–16

and 6–16 inches diameter, and of any thickness required. Other sizes are made to order at a limited cost. The depth of the recess in which the tablet is compressed is regulated by means of a simple device called a cam. After weighing out the powder for one tablet and adjusting the cam

FIG. 46.



so the mould will contain just the amount of powder required, the tablets will be made of uniform weight and thickness by simply filling the mould to the top. The powder is compressed by steady pressure of the handle, and the tablet is *delivered automatically* below the die, and clear of all dirt, and not on the platform where it is covered with the loose powder as in other machines. This seems to be a decided improvement over hitherto existing methods. The two plungers and die can be removed from this machine and a new set substituted within two minutes' time, and the size of the tablet cannot vary unless there is a deliberate effort to so change it. —Amer. Drug., March 10, 1897, 160.

Compressed Tablets—Practical Hints for Making them at the Dispensing Counter.—Stewart Hardwick, at the meeting of the Br. Pharm. Conference, 1896, gave some practical information concerning the preparation of tablets at the dispensing counter, using for this purpose a very simple apparatus constructed in England after the pattern in vogue in this country, and consisting of a cylinder into which the powdered substance is placed and compressed by means of a plunger and hammer. He ob-

serves that the journals have described from time to time tablet machines and processes of tablet making, but the machines are generally expensive, while the process of mixing and granulating the powders necessary in manipulating them is too troublesome when operating with small quantities. The substance to be compressed should be used in crystals and triturated to a coarse powder, since fine powders do not compress well. Any tendency of the tablet to stick in the die, or split, is overcome by spraying a trace of heavy paraffin oil over the powder. The same object is effected by adding a little powdered cocoa, from which the oil has been expressed; for example, after the following formula: Medicament, as ordered; powdered cocoa, ½ grain; sugar of milk, enough to make a two-grain tablet. Numerous other hints concerning special combinations or medicaments are given, and may be profitably consulted in the author's original paper, in Yearbook of Pharm., 1896, 311–313.

TINCTURÆ.

Tinctures of the U. S. Pharmacopœia—Unsatisfactory Quality of Certain Commercial Samples.—The Committee on Adulteration of the Ohio State Pharmaceutical Association reports the results of the examination of commercial samples of several official tinctures. Six samples of

Tincture of Opium were found to be deficient in alcoholic strength in all cases, 45 per cent. being the highest, whereas they should have contained 48.6 per cent. of alcohol by volume. One sample contained only 28 per cent. The morphine yield in one case was normal, in another above the normal (1.688 per cent), and in the other four was deficient, the percentage being 0.9605, 0.7172, *0.0373* and 1.0029. The lower percentage, 0.0373, can only be accounted for by presuming this preparation to have been made from exhausted opium. It is noteworthy that in its alcoholic strength this example approached very nearly to the official requirement. Of six samples of

Tincture of Nux Vomica, five were slightly deficient in alcohol, containing 60, 64—, 64—, 64— and 68 per cent., while one contained 75 per cent., the standard being 70 per cent. by volume. Two of them were deficient in alkaloid, containing 0.226 and 0.265 per cent. of alkaloids instead of 0.3 per cent., while the other four were slightly stronger, containing 0.309, 0.315, 0.319 and 0.328 per cent. respectively. Finally, five specimens of

Tincture of Ferric Chloride were examined, and like the foregoing, were found to vary from the official standard. Two samples contained 70 per cent. by volume of alcohol, the others 68, 66 and 35 per cent. respectively, the official requirement being about 70.5 per cent. of alcohol and 13.6 per cent. of anhydrous ferric chloride. Of the latter, the specimens contained 13.52, 13.8, 14.0, 14.3 and 16.2 per cent. respectively.—Proc. Ohio State Pharm. Assoc., 1896, 21–23.

Tinctures of the Austrian Pharmacopœia—Results of Examination.—Al. Kremel reports the following results of the examination of a number of tinctures prepared in conformity with the Austrian Pharmacopœia (VII.):

Tinctura Belladonnæ fol., Ph. A. VII.—In one sample the specific gravity was found to be 0.899; the dry residue of evaporation, 2.10 per cent.; ash, 0.33 per cent.; alkaloid, 0.065 per cent.

Tinctura Ipecacuanhæ, Ph. A. VII.—In two samples the specific gravity was 0.900 and 0.905: dry residue of evaporation, 1.876 and 2.03 per cent.; ash, 0.273 per cent., and alkaloid, 0.244 per cent.—the last two figures applying to the second sample.

Tinctura Opii Crocata, Ph. A. VII.—In five samples the specific gravity ranged from 0.985 to 0.993; the dry residue of evaporation, from 4.94 to 6.62 per cent.; the ash, from 0.243 to 0.295 per cent.—the morphine having been established at 1 per cent. during the preparation in each case.

Tinctura Opii Simplex, Ph. A. VII..—In ten samples the specific gravity varied between 0.974 and 0.979; the dry residue between 4.829 and 6.66 per cent.; the ash between 0.110 and 2.61—the morphine here also having been established at 1 per cent. in the preparation of the tinctures.

Tinctura Strophanthi, Ph. A. VII.—In nine samples the specific gravity was from 0.837 to 0.841; the dry residue yielded on evaporation ranged from 0.483 to 0.610 per cent., and the ash from 0.014 to 0.029 per cent.

Tincture Strychni, Ph. A. VII.—In two samples the sp. gr. was 0.906 and 0.982; the yield of dry residue was 1.093 and 1.03 per cent.; of ash, 0.012 and 0.033 per cent.; and of alkaloid, 0.164 and 0.214 per cent.—Ztschr. Oest. Apoth. Ver., Sept. 10, 1896, 685–686.

Tincture of Aconite—Variation in Color, Etc.—Frederick Lester observes that there has been some inquiry as to the cause for the difference in appearance between the tincture of aconite, U. S. P., 1880 and 1890. The Pharmacopœia, 1870, directed that the preparation be made with 50 per cent. alcohol. So made it was dark in color and readily miscible with water in quantities the physician might direct, without precipitation. The Pharmacopœia, 1880, directed alcohol, U. S. P., in its preparation, and it was pointed out by Dr. Squibb and others that, while the physicians had become accustomed to prescribe this preparation so many drops mixed in water and teaspoonful of mixture given at a dose, that the tincture made from the 1880 formula was not miscible in water without precipitation, and for that reason many pharmacists continued to use the menstruum directed in 1870 for making tincture of aconite root. It was maintained by them that this menstruum extracted the drug quite as thoroughly as did the alcohol directed in 1880. The 1890 revision recommends the use of 3 parts of water and 7 parts of alcohol in making this tincture, and the product is darker in appearance than the 1880 product. The author's

experiments have proven conclusively to his mind that the 50 per cent. alcoholic menstruum of the Pharmacopœia, 1870, will exhaust the drug as thoroughly as one more strongly alcoholic.—West. Drug., July, 1896, 297.

Tinctura Amara—Modification.—Richard Votjek recommends the omission of sodium carbonate in the formula of the Pharm. Austr. for tinctura amara and in its stead a corresponding quantity of nutmeg. The formula so amended is as follows: Fol. trifol. fibrin, Hb. centaur min., Rad. gentianae, Cort aurantior., āā 10; Nuc. moschat., 5; Aq. cinnamon. spirit., 500. He also recommends a modification of the Austrian official formula for

Tinctura Chinæ comp., whereby a tincture mixing clear with water is obtained. The diluted alcohol is replaced by alcoholic cinnamon water, the solvent action of which is increased by the addition of muriatic acid. The modified formula is given as follows: Cort. chinæ, 60; Rad. gentianæ, Cort. aurant., āā 20; Acid muriat. dil., 15; Aq. cinnam. spir., 485.—Zeitsch. Oest. Apoth. Ver., July 10, 1896, 532.

Tincture of Iodine—Precaution in Determining the Strength of Commercial Samples.—A. B. Stevens, having had submitted to him a sample of tincture of iodine which had, under the State Law of Ohio, been examined and found deficient in iodine, found, upon examination, that while the sample only contained 5.32 per cent. of pure iodine, it contained also hydriodic acid equivalent to 1.64 per cent. of pure iodine. The total of iodine, therefore, corresponded to the official requirement—about 7 per cent—and an inquiry is in order, and is under way by experiment, what causes this change from free iodine into hydriodic acid. Mr. Stevens reports on the examination of ten samples of tincture of iodine purchased from different stores in Michigan, and found them, with three exceptions, to contain the official percentages or (generally) more of iodine, but in each case over 1 per cent. and not over 2 per cent. of iodine had been converted into hydriodic acid. Of the three samples deficient in iodine, one contained a total of 3.90, the other 5.0 and the third 6.66 per cent. of total iodine; but here the percentages of hydriodic acid were very low, 0.14, 0.02, and 0.04 per cent. in the same order. The author proposes a method of making this tincture by percolation, which consists in rubbing the iodine to powder with coarsely-powdered glass or sand, then percolating with alcohol in a percolator made from a long glass tube. The receiver should contain a few Cc. of alcohol, to prevent the iodine from recrystallizing out of the concentrated first portion of percolate. Loss of iodine is thus almost completely avoided.—Proc. Mich. State Pharm. Assoc., 1896, 46–47.

Tincture of Iodine—Commercial Quality.—Leon M. Baldauf has examined twenty samples of tincture of iodine and found them in most cases to differ widely from the official standard (1890) of seven per cent. One

sample contained only one-half the amount, two samples were stronger than necessary, and the average strength was 5.79 per cent.—Amer. Journ. Pharm., Nov., 1896, 610.

Tincture of Nux Vomica—Assay of Commercial Samples.—Olive C. Johnson assayed sixteen samples of tincture of nux vomica by the official method. Five of these were from manufacturing houses and assayed from 0.24 to 0.33 per cent. of alkaloid—the average being 0.29 per cent. The other eleven were from retail houses. Of these a sample made by the formula of 1870 contained only 0.16 per cent. alkaloid and much fixed oil; three others made by the 1880 formula contained 0.20 to 0.30 per cent. alkaloid; one was made from fluid extract; the remaining six had been made in conformity with the formula of 1890, and contained from 0.21 to 0.31 per cent. of alkaloid.—Amer. Journ. Pharm., Nov. 1896, 609–616.

Tincture of Opium—Preparation from Granulated Opium.—In a former paper (Proc., 1896, 456) Lyman F. Kebler and Charles H. LaWall had advocated the use of granulated opium for preparing the tincture. Mr. Kebler has since found that the directions given must be modified to insure success (the extractive matter being so great as to choke up the percolator) and he now recommends, on the suggestion of his assistant, Mr. Durnier, that only one-third of the granulated opium be introduced into the percolator at first. Sufficient menstruum is then poured in to cover this and to saturate the remainder of the opium which is now added; then, percolation is immediately begun, and continued until about 10 per cent. of the tincture has percolated, when the orifice is stopped for three hours and 10 per cent. more obtained; and so on, alterate maceration and percolation until the required quantity is obtained.—Proc. Penna. Pharm. Asso., 1896, 74.

Tincture of Opium—Modification of Official (U. S. P.) Process.—W. P. Clarke prefers the following method for preparing tincture of opium: Place 100 Gm. of dry opium, in No. 10 powder, into a suitable vessel, and pour upon it 250 Cc. of water. Macerate 24 hours. Strain through muslin, and repeat the process of maceration with the dregs three times, with 250 Cc. of water each time. After the last expression, rub up the opium dregs, pack in a percolator, and percolate with water until 250 Cc. have passed; add this percolate to the united expressed liquids, filter, concentrate upon a water-bath to 500 Cc., add 500 Cc. of alcohol, mix, and filter. Of the numerous constituents of opium, the author regards only three of practical value, viz.: Morphine, codeine and, perhaps, narceine. These are all represented in the tincture prepared by the modified process, whereas the objectionable odorous matter, as well as the narcotine, are avoided.—Proc. Wisc. Pharm. Assoc., 1896, 39, 40.

Tinctura Opii Camphorata—Extemporaneous Formula.—Emile Ott, in

reply to a query, states that he has experimented and finds that tinctura opii camphorata can be made with equally good results by using the quantity of tincture of opium corresponding to the prescribed amount of powdered opium.—Proc. Penna. Pharm. Assoc., 1896, 110.

Tincture of Strophanthus—Method of Assay.—Searching for a method for the estimation of strophanthin in the tincture, which he finds to vary considerably as dispensed, John Barclay finally decided to make an estimation of the strophanthidin produced by the hydrolytic decomposition of the impure strophanthin, as leading to more reliable results than the various methods tried for the estimation of the strophanthin direct. The following is the method adopted; the table given shows the results of experiments made upon six samples of tincture prepared from six parcels of seeds obtained from various sources: Fifty Cc. being taken, 50 Cc. of water was added, and the spirit removed by distillation. The filtered aqueous liquid after being shaken with chloroform was digested one hour on the water bath with dilute sulphuric acid (this resulted in the production of a flocculent deposit of strophanthidin). After cooling, the turbid liquid was agitated with three successive small quantities of chloroform; the latter, after being separated, was removed by distillation, and the residual strophanthidin dried below 150° F. and weighed.

No. of Sample.	A Specific gravity of tincture at 15½° C.	B Percentage of extractive in tincture.	C Alcoholic extractive yielded by seeds (calculated from B).	D Percentage (on tincture) of water soluble extractive contained in tincture extractive.	E Strophanthin (not quite pure) obtained by treating aqueous extractive (see D) with absolute alcohol.	F Strophanthidin per cent. (see method of assay).	G Percentage of strophanthin calculated from strophanthidin (100 parts strophanthin = 36.5 parts of strophanthidin).
1	.842	.674	13.4	.622	.417	.1498	.410
2	.8425	.73	14.6	.661	.412	.1538	.421
3	.842	.59	11.8	.5136	.470	.1134	.310
4	.8415	.52	10.4	.489	.472	.1508	.413
5	.842	.546	11.0	.512	.360	.109	.298
6	.843	.557	11.6	.519	.385	.1296	.355
Mean	.842	.60	12.13	.552	.42	.1344	.368

Sample No. 3 was made from "brown" strophanthus seed.—Pharm. Journ., Nov. 28, 1896, 463.

VINA.

Fruit Wines—Distinction from Grape Wines.—Kuhlisch finds the alcohol per cent. in ciders to be low, ranging from 4.29–5.86 per cent., but the extractive and mineral matters are higher than in grape wines. The tannin is very slightly higher than in white grape wines, but the nitrogen is considerably lower. The only certain distinction between fruit and grape wines is that the former contain no tartaric acid nor its salts.—Chem. News, Dec. 11, 1896, 293; from Chem. Ztg., through Ztschr. Aml. Chem., 1896, Part 4 and 5.

Unfermented Wine—Method of Preparation.—Professor Muller has applied the principle of Pasteur's treatment of wine for the preservation of grape juice and other fruits without fermentation. He finds that when the freshly expressed juice is heated in bottles to a temperature of from 60° to 70° C. for fifteen minutes the yeast cells and other fermenting agents are rendered inactive. The juice can then be kept in well-closed bottles for several years without fermenting. To obtain the juice clear it must, however, be filtered, an operation which is easily carried out, as the heating will have coagulated the mucilaginous substances, causing turbidity. Filtration may be carried out immediately after heating the ju ce, or after some time, but in any case the filtered juice must be again heated in bottles to the same temperature originally applied, and then it will keep clear in well-closed bottles for several years. Some grape juice bottled in this manner in 1882 is still sound and unfermented.—Pharm. Journ., Oct. 3, 1896, 291; from Apoth. Ztg., 1896, 724.

Wine of Condurango—Formula.—Proskauer recommends the following formula for condurango wine, which is said to be excellent: Macerate 75 Gm. condurango bark, 2.5 Gm. each of orange peel and cinnamon, and 1.5 Gm. each of gentian and muriatic acid, in 750 Cc. of sherry wine for eight days, strain, add 60 Gm. of simple syrup, and filter.—Zeitschr. Oest. Apoth. Ver., Jan. 10, 1897, 30.

MISCELLANEOUS PREPARATIONS.

NUTRIENTS.

Wheat Phosphates—An Old and Tried Formula.—As long ago as 1867 Mr. Albert E. Ebert published a formula for wheat phosphates to be used as a children's food, and his formula may, in the light of modern dietetics, be reproduced here:

Take 1 pound of wheat bran, free from dust, and add 6 pints of water. Boil down to 4 pints, being careful not to burn it, and strain while hot with pressure. Transfer to a water-bath, and evaporate as quickly as possible, with stirring, until it has acquired the consistence of an extract. If evaporated too slowly a sour taste will develop. When the extract-consistence has been reached, desiccate slowly, by the heat of a water-bath, until the

mass has become friable. Reduce it to a fine powder, and mix it with powdered sugar in the proportion of 1 part of wheat phosphates to 3 parts of sugar. Pass through a fine sieve.

The average yield of dry extractive is 25 per cent., which, when mixed with three parts of sugar, represents the original weight of bran used. This wheat phosphate is especially recommended for young children in whom the assimilative function is at fault. It may be used in place of sugar in teaspoonful doses, added to the food.—West. Drug., April, 1897, 173.

Phospho-Cereal—A Coffee Substitute.—Prof. T. H. Norton has examined "phospho-cereal," a product which is used to prepare a decoction not unlike coffee in its taste and appearance. It is said to be obtained by parching the bran of various cereals, and its value is claimed to reside in the amount of soluble phosphates present. Prof. Norton found the total amount of phosphorus present in this product to be 5.18 per cent., calculated as P_2O_5, but that by ordinary boiling with water only about one-fourth of this is represented in the decoction, whereas by prolonged boiling not quite one-half of the phosphoric acid enters into solution. Phosphites and hypophosphites are absent.—Pharm. Rev., March, 1897, 47.

Creosote Coffee—A New Mode of Administering Creosote.—Dr. Peter Kaatzer recommends a mixture, containing 10 Gm. creosote and 40 Gm. extract of coffee in a liter, as being a pleasant and useful mode for the administration of creosote. Given daily in quantities of 15 to 20 Gm. in about 60 to 80 Gm. of milk or beer, after meals, the unpleasant taste of the creosote is fairly well covered, and the medicament reaches the stomach well diluted. Moreover it has the advantage over capsules and pills in its disinfectant action upon the mucous membranes of the mouth and throat. —Zeitschr. Oest. Apoth. Ver., July 20, 1896, 552; from Ther. Monatsh., 1896, v.

Condensed Milk—Examination of the Different Brands in the English Market.—Alfred H. Allen has examined different brands of condensed milk, and gives the results in three tables, representing the three classes that are found in the English market, viz.: Class I., unsweetened condensed milk, a kind simply concentrated to one-third or less, and containing no addition except possibly a small quantity of preservative; Class II., milks treated after or during concentration with a large quantity of cane sugar; and Class III., milks which receive special treatment with a view of giving them a composition approximating to that of woman's milk. Four samples of the first class were examined, and were apparently of satisfactory composition, containing from 35.1 to 44.6 per cent. total solids, 9.5 to 10.5 per cent. fat, 9.7 to 14.7 proteids, 14.2 to 18.5 per cent. milk sugar, and 1.8 to 3.5 per cent. ash. The twelve samples of sweetened condensed milk, on the other hand, all contained excessive quantities of

cane sugar, even when expressly stated on some labels that "only a small quantity of pure cane sugar has been added." The percentage of milk solids in sweetened condensed milk being about three times that in the unconcentrated milk, it follows that twice its weight of water will reduce the milk to its original concentration. But such a proportion of water will produce a fluid of the consistency of thick cream, and of an intolerably sweet taste. Hence when intended for general use it becomes necessary to dilute sweetened condensed milk to an extent far beyond that justified by its concentration. Of the third class, those claimed to have the composition of human milk, only two brands were examined—practically only one now in the market, since the second brand is now marketed in place of the first, comparison of the composition of this second or "improved" brand (so-called "humanized milk") shows it to correspond more nearly to human milk than the original brand; but the total solids are here too high, whereas originally they were too low.

In summing up, the author condemns the statement made on many brands of condensed milk that, for infants' use, the preparation should be diluted with six to fourteen parts of water. If such directions are followed, either the child will be half starved, or it will have to imbibe such an enormous quantity of fluid as cannot fail to be a serious strain on its system.—Yearbook of Pharm., 1896, 326–330.

SURGICAL DRESSINGS.

Surgical Dressings—Modern Improvements in their Preparation and Application.—At the pharmaceutical meeting of the Philadelphia College of Pharmacy, in December, 1896, F. B. Kilmer read an address on the subject of "Modern Surgical Dressings," which is highly interesting from both a technical and practical standpoint. Prior to the introduction of antiseptics into these dressings by Sir Joseph Lister, some twenty years ago, no attention was paid to this important subject. But with the dawn of the present era of surgery, the teachings of Lister demanded that the dressings to be applied to a wound should be saturated with chemicals capable of killing germs "within the wound or coming out of it." It is true that in these early days the antiseptics were empirically applied; cloth was plastered with masses of pitch, paraffin fat and carbolic acid, and the crude products were unclean, sticky, irritating and non-absorptive, directly the opposite to those in use at the present time. In his very exhaustive paper Mr. Kilmer describes how the changes to the present excellent standard of quality came about, the technical operations that are involved, and the precautions that are observed in the preparation, preservation, and dispensing of modern surgical dressings. Referring to the author's paper for the details of these operations, his concluding remarks concerning the care requisite in handling these important adjuncts to modern surgery may

be briefly noticed. He observes that there is no article in the druggist's stock which should receive greater care and judgment. Upon every yard of gauze, sponge or ligature he dispenses, hangs perhaps the life or death of a patient and the reputation of a surgeon. They should be guarded from every channel of direct or indirect infection. A closet or a room or a case should be provided for their reception that is cleanable; it should be cleaned often and kept clean. They should be sold within the containers in which they are packed in their preparation. They should never be broken open for sale or for any other purpose, but should be delivered to the surgeon so perfect that there can be no question as to their integrity, placing all the responsibility for their subsequent care in his hands.—Amer. Journ. Pharm,, Jan. 1897, 24–39.

Asbestos Surgical Dressings—Possible Usefulness.—Dr. Kane suggests that possibly asbestos may afford a useful fabric for surgical dressings, from the ease with which it may be thoroughly and quickly disinfected; since, after washing, it may be rendered absolutely aseptic by heating a few minutes in a bright fire. The fibre employed is as soft as floss silk, and, when woven into a fabric, is more absorbent than cotton.—Pharm. Journ., Dec. 26, 1896, 546; from Brit. Journ. Dent. Science, xxxix., 1045.

Gauzes—Estimation of Phenol, Salicylic Acid and Iodoform.—G. Frerichs critically reviews the various methods that have been proposed for the assay of phenol-, salicylic acid- and iodoform-gauzes, and makes the following recommendations:

Phenol Gauze.—For the estimation of phenol in gauzes Beckurt's modification of Koppeschaar's method has been found the simplest and most accurate. This consists in causing a known amount of bromine to react with the phenol, the excess of the former reagent being estimated, after adding potassium iodide, with $\frac{N}{10}$ sodium hyposulphite solution. The reagents necessary are the following: (*a*) $\frac{N}{20}$ potassium bromide (= 5.939 grams KBr to 1000 Cc.); (*b*) $\frac{N}{100}$ potassium bromate (= 1.666 grams $KBrO_3$ to 1000 Cc.); (*c*) $\frac{N}{10}$ sodium thiosulphate solution; and (*d*) Conc. solution of potassium iodide. For the estimation, the phenol solution should be of the strength of 1 to 1,000, obtained by exhausting 1 to 2 grams of the gauze with 100 Cc. of warm water, employing a closed flask and digesting for 10 minutes. From 25 to 35 Cc. of the phenol solution are brought into a glass-stoppered flask, followed with 50 Cc. each of the solutions *a* and *b* and 5 Cc. of concentrated sulphuric acid. The mixture is then thoroughly shaken. After a time, an opalescence appears, caused by the precipitation of tribromphenol and tribromphenolbrom ($C_6H_2Br_3OBr$); soon the excess of bromine is manifested by the yellow color the solution assumes. After 10 to 15 minutes the flask is opened, potassium iodide solution added and the liberated iodine titrated by means of $\frac{N}{10}$ sodium thiosulphate solution. The addition of sulphuric acid liber-

ates 0.2392 gram of bromine from the mixture of 50 Cc. each of the potassium bromide and bromate solutions, which unites with 0.0469 gram of phenol. 1 Cc. of $\frac{N}{10}$ sodium thiosulphate solution corresponds to 0.08 gram of bromine, which in turn unites with 0.00156 gram of phenol. On subtracting for every cubic centimeter of sodium thiosulphate solution which was necessary to combine with the iodine liberated by the excess of bromine, 0.00156 from 0.0469, the amount of phenol contained in the number of cubic centimeters employed is obtained.

Salicylic Acid Gauze.—This is a simple operation. Five Gm. of the sample are exhausted with alcohol, to this a few drops of phenolphtalein are added and the solution titrated with $\frac{N}{10}$ solution of sodium hydrate. The number of cubic centimeters of the soda solution employed, when multiplied by 0.0138, gives the weight of salicylic acid, expressed in grams, contained in 5 grams of the gauze.

Iodoform Gauze.—For the determination of the iodoform the author recommends Huss' method, which depends upon the conversion of the iodoform into an inorganic iodine compound, from which the iodine may then be estimated volumetrically and calculated into iodoform. From 1 to 5 grams of the gauze are placed in a large test-tube, and sufficient zinc dust (c. p.) shaken over it to leave a layer of 2 Cm. thick above, about 2 grams being necessary. The tube and contents are heated in a water bath for some time, then the gauze and zinc dust can either be extracted with several portions of hot water, filtered and made up to 500 Cc.; when cool the iodine is estimated in 250 Cc. of the filtrate, on multiplying by 4 the total amount of the iodine is obtained. Or the mixture of gauze, zinc iodide and zinc dust must be boiled with the solution of sodium carbonate, extracting with hot water, filtering and making up to 500 Cc. In the filtrate the iodine is estimated by titrating with potassium permanganate, or by means of $\frac{N}{100}$ silver nitrate solution, after having acidified the alkaline sodium iodide solution with nitric acid, neutralizing the excess of acid with calcium carbonate.—Pharm. Era., Oct. 1, 1896, 433; from Apoth. Ztg.

Antiseptic Gauzes—Various Formulas.—Martensen prepares antiseptic dressings as follows: Rolls of cheese-cloth about thirty yards long are folded, placed in jars, and one of the following solutions poured on according to the kind of gauze to be made:

Carbolized Gauze, 5 Per Cent.—Colophene, 50; castor oil, 15; carbolic acid, 28; alcohol 90°, 207 parts; 300 parts by weight of this mixture are used for 500 parts of gauze: or the following may be used: Vaseline, 30 parts; carbolic acid, 28; benzin, 242 parts; 300 parts for 500 of gauze.

Thymolized Gauze.—Thymol, 10; turpentine, 3; paraffin oil, 10; benzin, 200 parts. Use for 500 parts of gauze.

Sublimated Gauze.—Bichloride of mercury, 1½; sodium chloride, ½; glycerin, 15; distilled water, 500 parts. Use equal parts of solution and gauze.

Iodoform Gauze.—Iodoform, 50; paraffin oil, 10; ether, 460 parts. Use 460 parts of solution to 500 parts of gauze.

In each case the gauze is allowed to soak for twelve hours, then dried and stored in air-dry jars.—Pharm. Journ., Sept. 19, 1896, 258; from Therap. Gaz. (3), xii., 407.

Borated Gauze and Cotton—Estimation of Boric Acid.—The following method for the assay of borated gauze and cotton is proposed by Beckurts and Danert: As solvent a mixture of water and glycerin in the proportions of 20 to 1 was found best. Of the borated cotton or finely cut gauze, 5 Gm. are shaken with about 400 Cc. of a mixture of 1 part of glycerin and 19 parts of water, employing a flask of 500 Cc. capacity. From this fluid 100 Cc. are drawn off and titrated with a $\frac{N}{10}$ normal sodium hydrate solution with addition of glycerin and employment of phenolphtalein as indicator. The number of cubic centimeters of $\frac{N}{10}$ normal sodium hydrate solution employed when multiplied with 0.0062, gives the total quantity of boric acid contained in 5 Gm. of material; this multiplied by 100 gives the percentage composition.—Pharm. Era, April 1, 1897, 391: from Apoth. Ztg.

Pyoctannin-Mercury Gauze—Preparation.—The following formula is given in connection with a brief article on *Pyoctannin-Mercury* (which see under "Organic Chemistry"): 100.0 Gm. gauze, free from starch, is saturated with 60.0 Gm. of an aqueous solution of 1.0 Gm. mercuric chloride and 5.0 Gm. ammonium chloride. It is dried and then immersed in a ½ per cent. solution of *blue* pyoctannin, wrung out, and dried.—Zeitschr. Oest. Apoth. Ver., July 10, 1896, 534.

Catgut—Sterilization.—Dr. R. C. Larrabee proposes the following modification of Saul's method of sterilizing catgut: Wind the gut in a single layer on pieces of large glass tubing, which is then placed in a tightly-stoppered flask, provided through the cork with a reverse condenser consisting of a glass tube at least five feet long. The flask having been filled with Saul's fluid, composed of absolute alcohol 850, carbolic acid 50, and water 100 parts, so as to cover the catgut completely, the liquid is boiled for from 45 minutes to an hour. The condenser being then removed, the flask is closed with a sterilized cork, and the sterilized catgut preserved in the solution until required for use.—Bost. Med. and Surg. Jour., 1897, 86.

Sterilized Catgut—Cheap and Efficient Method.—Hofmeister recommends the following method of sterilizing catgut: The catgut is drawn over a glass plate—9x17 Cm., projecting at the sides—and laid in a formalin solution of 2 per cent. to 4 per cent. from twelve to forty-eight hours; it is then washed in running water for at least twelve hours, after-

wards boiled for ten to thirty minutes, finally hardened and preserved in absolute alcohol, with 5 per cent. glycerin, and 1 per cent. sublimate, or 4 per cent. carbolic acid. It has been proved that this process does not injure the elasticity of the catgut, and is to be recommended on account of its simplicity and cheapness. An important point to be observed is that the fibres must be strongly stretched, and the free formalin thoroughly removed before heating, as the thread will otherwise be brittle.—Pharm. Journ., Dec. 12, 1896, 514; from Münch. Med. Woch. xliii.

TOILET REQUISITES.

Dentifrice—A New Formula.—The following formula for a tooth powder is given in "El Memorandum": Strontium carbonate, 30 Gm.; flowers of sulphur, 30 Gm.; cream of tartar, in fine powder, 25 Gm.; milk sugar, 40 Gm.; salicylic acid, 10 Gm.; eucalyptus oil, 20 drops. Mix carefully.—Pharm. Journ., Aug. 29, 1896, 195.

Face Powders—Composition.—Dr. William Murrell has reported the following results of an examination of popular face powders, determined by Dr. Wilson Hake:

—	1.	2.	3.	4.	5.	6.	7.	8.
Starch	75	80	80	15	50	—	40	40
Precipitated chalk and carbonate of magnesium	15	—	—	—	—	—	—	10
French chalk	10	12	—	45	36	75	18	18
Zinc	—	7	20	40	14	25	40	30
Bismuth	—	1	—	—	—	—	1	1
Lead	—	—	—	—	—	—	1	1
	100	100	100	100	100	100	100	100

The powders were both non-proprietary and proprietary, and some of them were French. The starch in Nos. 1, 3, 4 and 5 was rice-starch, whilst Nos. 2, 7 and 8 contained maize-starch only. All specimens were carefully examined for mercury and arsenic, but none was found. Respecting the preparations themselves, Dr. Murrell adds the following notes:

1. This was described as a rose-leaf powder. It had a faint odor of rose, but was certainly not made from rose-leaves.

2. This was sold as a rice-powder prepared with bismuth. It contained no rice-powder, and very little bismuth, certainly not more than 1 per cent.

3. This was a rice powder free from bismuth. The analysis proved the correctness of the statement, but it also showed the presence of 20 per cent. of zinc, probably in the form of calamine.

4. This was sold without any guarantee of purity, which was perhaps fortunate, as it contained 40 per cent. of zinc.

5. This was described as "Poudre Rosée." It contained 36 per cent. of French chalk and 14 per cent. of carbonate of zinc.

6. This was sold as "Poudre de Riz de Java," but no rice-starch could be detected in it.

7 and 8. These were similar in composition, and were remarkable for containing three metallic ingredients—zinc, bismuth and lead.

Another specimen examined gave very unexpected results, says Dr. Murrell, for it consisted solely of finely-powdered boracic acid. It was entirely and completely soluble in water, and corresponded in all respects to this substance when examined chemically, microscopically, and with the spectroscope.—Chem. & Drugg., April 24, 1897, 663; from Brit. Med. Journ.

"Sandmandelkleie"—Composition of this Form of Almond Meal.—G. Marpmann has investigated two specimens of "sandmandelkleie" from widely differing sources, and finds them both to contain diatomaceous earth, the one containing 62 per cent. of such earth of the type characteristic of the Lüneburger Heide, the other only about 30 per cent. of diatomacecus earth coming from the region of the Danube. While genuine "sandmandelkleie" is said to be almond meal or flower (from press cake) containing 10 per cent. of the finest sea sand which has been previously treated with hydrochloric acid to remove fragments of shell, etc., it is authoritatively stated that both sea sand and diatomaceous earth are used in this connection. Mr. Marpmann observes that while the preparation made with sea sand and almond meal alone cannot be injurious to the most delicate skin, that made with diatomaceous earth, consisting in great part of slender, pointed and often angular bodies, cannot but be injurious when rubbed into the epidermis.—Pharm. Rev., Nov., 1896, 261; from Ztschr. f. angew. Mikros., *2*, 10.

Aureol—A New Hair Preparation.—According to Dr. Richter, aureol, an innocuous preparation for coloring the hair any desired shade, is a solution containing 1 per cent. metal, 0.3 per cent. amidophenol hydrochlorate, 0.6 per cent. monamidophenylamin, 0.5 per cent. sodium sulphite, and 50 per cent. alcohol. The hair is preliminarily deprived of fat with soda and soap solution. A mixture of equal parts of aureol and of a 3 per cent. solution of hydrogen peroxide is then applied by moistening a fine comb and combing the hair with it until it is uniformly moistened. After 2 or 3 hours the hair is colored deep brown, and the color may be deepened to any shade by repeating the treatment.—Zeitschr. Oest. Apoth. Ver., Jan. 10, 1897, 30.

Hair Tonic—Formula.—The following is recommended in "Pharm. Zeitschr. f. Russ." to prevent the falling off of the hair: Chlorhydrate of quinine, 4; tannin, 10; rectified spirit, 880; tincture of cantharides, 10; pure glycerin, 60; eau de Cologne, 40; vanillin, $\frac{1}{10}$; sandal wood, crushed, 5 parts. Macerate for four days, then filter.

CEMENTS AND PASTES.

Cement—Useful Formula for Microscopic Use.—A. C. Cole gives the following formula for a cement which is useful for affixing minute objects to thin glass covers, prior to mounting them in Canada balsam: Two grains of gum arabic are dissolved in one ounce of cold distilled water, three minims of glacial acetic acid are added, and the least possible trace of sugar. Filter carefully through filter paper, and repeat the operation in a few weeks. This cement has been found to stand the test of use for many years, being quite unaffected by the balsam and also invisible, even under the highest powers.—Pharm. Journ., Sept. 19, 1896, 258; from Methods of Microsc. Research.

Cement for Amber, Meerschaum and Ivory—Formula.—The following formula is given in "Zeitschr. Oest. Apoth. Ver." (Aug. 20, 1896, 620): 8 p. of finely cut isinglass are softened in water containing a little alcohol; 1 p. of gum galbanum, 1 p. of gum ammoniac, and 4 p. of alcohol are then added, the mixture is heated, and applied to the object while warm.

Bicycle Rim Cement—Formula.—Frank Edel recommends a cement for bicycle rims, prepared by dissolving one pound of shellac in one pint of alcohol and adding one-half ounce of castor oil. The addition of the oil prevents the cement from becoming hard and brittle.—West. Drugg., Nov., 1896, 488.

Liquid Glue—Sodium Salicylate as a Preservative.—The "Chem. and Drug." (Jan. 9, 1897, 51) describes a recent German patent for making liquid glue as follows: 100 parts of glue are softened in 150 parts of water, after which 10 parts of sodium salicylate are added, the mixture being heated in a water bath until the glue is thoroughly dissolved. Then 1 drop of oil of cloves to each ounce of the mixture is added. The salicylate keeps the glue from settling in the pot.

Pastes and Mucilages—Practical Formulas.—The following formulas are given in "Western Painter," and appear to be practical:

Label Gum, for paper to glass.—Powdered acacia, 4 oz.; boiling water, 6 fl. oz.; glycerin, 2 fl. oz. Dissolve the acacia in the water, and add the glycerin.

Label Paste, for Tins.—*a.* Brown sugar, 4 lb.; boiling water, 1 qt. *b.* French gelatin, 1 oz.; water, 8 fl. oz. *c.* Corn starch, 1½ lb.; cold water, 1½ pt.; boiling water, ½ gal. Beat the corn starch with the cold water, pour the batter into the boiling water, and continue boiling until the paste is translucent. Make solutions of "*a*" and "*b*" separately, and then mix them with "*c*." Paste for tin should not be too thin, and the tin should be free from grease.

Label Paste, for Metal.—Powdered tragacanth, 1 oz.; powdered acacia, 4 oz.; water, 20 fl. oz.; glycerin, 4 fl. oz.; Thymol, 80 grs.; boiling water, 12 fl. oz.

Tissue Paper Paste.—*a.* Powdered acacia, 4 oz.; white sugar, 1 oz.; boiling water, 6 fl. oz. *b.* Starch, 3 oz.; water, 6 fl. oz.; make into a batter and pour into boiling water, 2 qt. Mix "*a*" with "*b*," and keep in a wide-mouthed bottle.

Perfect Paper Paste.—*a.* Powdered tragacanth, 1 oz.; boiling water, 8 fl. oz. *b.* Powdered acacia, 1 oz.; salicylic acid, 1 dr.; boiling water, 2 fl. oz. *c.* Wheat flour, 2 oz.; white dextrin, ½ oz.; water, 2 fl. oz.; make into a batter and pour into boiling water, 12 fl. oz. Mix "*a*" with "*b*," and add "*c*"; then add ½ fl. oz. of glycerin, to which has been added 8 drops of oil of lavender. This is a good preparation, but is rather complicated to make up.

Parchment Paste.—*a.* Powdered rice, 2 oz.; boiling water, 12 fl. oz. *b.* Powdered acacia, 2 oz.; boiling water, 4 fl. oz. *c.* White sugar, 1 oz.; salicylic acid, 16 grs.; boiling water, 1 fl. oz. Boil "*a*" for half an hour, let cool somewhat, strain, and then stir in "*b*" and "*c*." This paste is from an old English recipe, and is a nice article; but, like the preceding, it is too much trouble taken for the result obtained.

Tragacanth Mucilage, for Paper.—Powdered tragacanth, 1 oz.; glycerin, 4 fl. oz.; boiling water, 16 fl. oz. Macerate the tragacanth with the glycerin in a glass mortar, then stir the paste into the boiling water. This makes a very thick mucilage; 32 fl. oz. of boiling water gives a medium, and 64 fl. oz. a thin paste.

Household Mucilage, for Paper, etc.—Powdered acacia, 3 oz.; white sugar, 1 oz.; boiling water, 5 fl. oz.; white wine vinegar, 1 fl. oz. (or acet. acid, 2 fl. dr.; water, 6 fl. dr.). Make a solution of the first three ingredients, and add the vinegar.

Dextrin Mucilage, for Paper, etc.—Yellow dextrin, 4 oz.; distilled water, 6 fl. oz. Dissolve cold, as heat destroys the adhesive properties of dextrin. If a more fluid gum is desired, use 8 fluid ounces of water.

Dextrin Paste, for Glass.—Yellow dextrin, 8 oz.; thymol, 10 gr.; tepid water, 18 fl. oz. Dissolve.

Dextro-Acacia Mucilage, for Paper, Parchment, etc.—*a.* Yellow dextrin, 4 oz.; water, 8 fl. oz. *b.* Powdered acacia, 4 oz.; boiling water, 8 fl. oz. *c.* Glycerin, 2 fl. oz.; oil cinnamon, 4 drops. Dissolve each separately, then mix. This is a good article, and easy to prepare. It does not keep as well, however, as borax mucilage, which is unalterable.

Antiseptic Paste—For Organic Specimens.—*a.* Wheat flour, 1 lb.; beat to a batter with 1 pt. water; then pour into boiling water 1 qt. *b.* Powdered acacia, 2 oz.; boiling water 4 fl. ozs.; dissolve. *c.* Powdered alum, 2 oz.; boiling water, 4 fl. oz.; dissolve. *d.* Lead acetate, 2 oz.; boiling water, 4 fl. oz. Mix "a" and "b" while hot, and continue to simmer, in the meanwhile stir in "c," and mix thoroughly; then add "d." Stir briskly, and empty in 10 grs. of corrosive sublimate. This paste is very

poisonous. It is used for anatomical work and for pasting organic tissue, labels on skeletons, etc.

Glue Paste—For Cloth, Books, etc.—a. White glue, 4 oz.; water, 8 fl. oz.; soak for four hours, then dissolve in a glue pot. *b.* Corn starch, 4 oz.; water, 8 fl. oz.; boiling water, 16 fl. oz.; make the corn starch into a batter with the cold water, and pour into the boiling water. Mix "a" with "b," and gently heat for ten minutes. If wanted elastic, add 4 fl. oz. of glycerin.—Merck's Rep., Oct. 1, 1896, 512.

Mucilage of Gum Arabic—Sulphate of Zinc as a Preservative.—Dr. E. Vogel suggests the addition of a small proportion of sulphate of zinc to mucilage of gum arabic to prevent its decomposition. Obviously the mucilage can only be treated in this manner if it is intended to be used as an adhesive, with which property it does not interfere; though in some cases, as for photographic purposes, the sulphate of zinc may be inadmissible on account of possible reaction that may take place.—Amateur Photograph., 1896.

DETERGENTS.

Cleansing Emulsion.—The following formula for a cleaning fluid that removes grease and stains from cloth, etc., more readily than the component ingredients separately, is given in "Pharm. Post:" Benzene, 500; petroleum ether, 500; hard soap, 3 parts; distilled water sufficient to make an emulsion. A solution of the soap in 50 to 60 parts of water is made, and the hydrocarbons are gradually added with constant shaking. If the emulsion does not form readily, its completion may be hastened by the addition of 50 or 100 parts of tepid water.

Eluedin—A Benzin Jelly Used as Detergent.—Sztankay calls attention to benzin jelly or emulsion as possessing greater cleansing power than the benzin itself, and particularly to a Hungarian specialty, sold under the name of "Eluedin" or "Seifenmilch," which proved to be such a preparation, and for which he recommends the following formula: About 3 grams of soap is dissolved in 50 to 60 Cc. of lukewarm distilled water in a 2-liter flask. The benzin is gradually added, while thoroughly shaking the contents of the flask. If the emulsion is slow in forming, the flask may be placed in warm water, or 50 to 100 Cc. of warm water (temperature 60° to 80° C.) may be added with renewed shaking. In this manner 1,000 to 1,500 grams of the hydrocarbon can be emulsified with only 3 grams of soap. The emulsion is thick and must be set aside for several days, after which time the excess of water separates.—West. Drug., Jan., 1897, 18; from Pharm. Post.

INSECTICIDES.

Insecticide for Plant Lice—Effective Formula.—The following formula for an effective insecticide for insects on plants, is given in Rev. Méd.

Pharm., III., 301: Macerate for several days 20 p. soft soap, 6 p. quassia wood, and 2½ p. salicylic acid in 200 p. methylated spirits. Apply to the infected parts, after dilution with sufficient water, by means of a brush, and allow to dry. On the following day, wash off with plenty of water.

Paraffin-Naphthalene Emulsion—Preparation and Use as Insecticide.—The following formula for a "paraffin-naphthalene emulsion," useful as an insecticide (for spraying on plants? Rep.) by diluting 15 p. with 1000 p. of water, is given in Pharm. Rev. (Jan. 1897, 16): One kilo of naphthalene is dissolved in 10 kilos of hot paraffin oil, and this solution is emulsified by thorough shaking with a solution of 33 kilos of soft soap and 33 kilos of water at a temperature of 85° C. This emulsion can be diluted with water without separation of paraffin oil.

INKS, STAINS, ETC.

Ink for Writing on Glass—Formula.—The following formula for an ink which is said to be indelible, and to allow the marking of bottles without having recourse to labels, is given in "Pharm. Journ" (Oct. 10, 1896, 314): Take 20 parts of brown shellac, and dissolve it in the cold in 150 parts of methylated spirit; dissolve 35 parts of borax in 250 parts of distilled water; then slowly pour the shellac solution into that of borax. The mixture may then be tinted to any color by adding a solution of a water soluble dye, for instance, violet, with methyl violet.

Skriptol—A Concentrated Ink Extract.—Krueger prepares a concentrated ink-extract which is marketed under the name of "skriptol." It is a tannin ink to which considerable dextrin and nigrosine have been added. Diluted with 20 to 25 parts of water it can be used as a writing or copying ink. The advantage of the concentration consists in the convenience with which large quantities of ink can be prepared.—Pharm. Ztg., 1896, 573.

Black Stain on Iron—Formula and Use.—The "Revue Suisse de Photographie" gives the following formula for producing a dull, black stain on iron: Mercuric chloride, 2 p.; cupric chloride, 1 p.; hydrochloric acid, 6 p.; alcohol, 5 p.; water, 50 p. The article, carefully cleaned, is either immersed in this solution, or the solution may be applied with a brush, after which it must be well soaked in hot water. A second application may be given if the color is not dark enough.

Silvering Fluid—Analysis.—Edo Claassen has analyzed a liquid which has been highly recommended for silver plating. It had an alkaline reaction and contained 1.2116 per cent. of potassium-silver cyanide and 0.3036 per cent. of potassium ferro-cyanide.—Pharm. Rev., May, 1897, 87.

Flash-light Powder—Formula.—Ommeganck states that a satisfactory flash-light powder for photographic purposes can be prepared by triturating together: 5 p. magnesium dust; 3 p. aluminum dust; 1 p. amorphous phosphorus. This preparation is said to give a more rapid flash than

simple magnesium or aluminum dust, and is free from the danger attending the use of explosive mixtures containing potassium chlorate.—Pharm. Journ., Aug. 29, 1896, 180; from Amateur Photographer, xxiv, 146.

TRADE-NAMED PREPARATIONS.

Acetocaustin.—According to Dr. Aufrecht, this is a 5 per cent. solution of trichloracetic acid.—Pharm. Ztg., 1896, 873.

Aiodin—Active Constituent of Thyroid Glands.—Hoffmann and Traube introduce, under the trade name "Aiodin," a preparation which they claim represents the active constituent of thyroid glands in the same state of combination as it exists naturally. It is a light powder, odorless and tasteless, insoluble in water, and contains about 0.4 per cent. iodine.—Pharm. Centralb., 1896, 718.

Arthriticin.—This is stated to be the nitril of ethyl-cresol, of amidoacetic acid, and of di-ethylenimine, and is introduced as a new remedial agent.—Ztschr. Oest. Apoth. Ver., Jan. 10, 1897, 29.

Ammonol—Not a Single Compound as Claimed.—Geo. M. Beringer has made an examination of the substance introduced into medicine under the name of "Ammonol," and claimed by the manufacturer to be a compound of definite composition, viz., "Ammoniated-Phenylacetamide." His results force him to the conclusion that, instead of being a "new coal-tar derivative," ammonol is merely an admixture of acetanilid, sodium bicarbonate and ammonium carbonate, and that the following formula represents its real composition: Acetanilid, 10.0; sodium bicarbonate, 5.0; ammonium carbonate, 5.0; metanil-yellow, 0.005.

Anti-bacterin—A Ferruginous Inhalant.—Dr. V. Wachter describes a new inhalant under the name of "Anti-bacterin." It is a ferruginous preparation of boric ether, constituting a greenish-yellow fluid. After inhaling it the expired air is seen to contain suspended fumes of boric acid.—Pharm. Journ., Oct. 31, 1896, 378.

Anusol—A New Remedy for Piles.—The bismuth compound of iodoresorcin-sulphonic acid is introduced under the trade name of "Anusol," and is recommended in the form of suppositories for the treatment of piles.—Pharm. Journ., Oct. 31, 1896, 378.

Aseptolin—Composition.—The substance recommended by Dr. Edson under the coined name "Aseptolin" for the treatment of tuberculosis, is stated by Lengfeld to be a solution of a compound of pilocarpine and phenol.—Pharm. Journ., Oct. 31, 1896, 378.

Citruria—A New Remedy.—Radlauer has introduced tablets said to be composed of urea, citric acid, and lithium bromide, under the name of "Citruria."—Pharm. Centralh., 1896, 816.

Filmogen—A New Dermatological Vehicle.—Dr. Schiff calls attention to "filmogen," a new vehicle for the application of medicinal substances in

dermatological treatment. The composition of the new substance is withheld, but it is reported by Dr. Schiff to possess qualities which give it great superiority over similar substances now used in dermatological practice for this purpose. It forms an elastic, impervious coating, which is absolutely insoluble in water, so that the parts may be washed without interfering with the application that has been made with it.—Zeitschr. Oest. Apoth. Ver., Sept. 10, 1896, 686.

Liquor Adhæsivus, is a synonym for the preparation introduced by Schiff under the name of "Filmogen."—Ibid., Oct. 1, 1896, 734.

Gelanthum—A New Skin Varnish.—Dr. Paul Runge has introduced under the name of "gelanthum," a compound of tragacanth and gelatin, which was suggested by Dr. Unna as a more satisfactory skin varnish than the casein ointment heretofore employed for this purpose. The mucilage of tragacanth and gelatin solution, prepared separately, are mixed on a water bath, about 5 per cent. of glycerin added, and a minute quantity of thymol to prevent mouldiness. When applied to the skin, gelanthum forms a flexible adherent coating.—Pharm. Ztg., 1896, 694.

Germol—A Cresol-like Antiseptic.—Under the name of "germol" a new antiseptic has been introduced, which, according to Dr. Aufrecht, is strikingly analogous in its physical and chemical characteristics to cresol. It is a clear, reddish-brown, oily, neutral fluid, of a pungent, creolin-like odor, and a similar burning taste. Shaken with water, a milkiness results, that, in contact with air, soon becomes a red-colored emulsion, and that, upon addition of a large quantity of water, becomes transparent. It is clearly miscible in all proportions with alcohol, and with ether it forms a gelatinous mass that dissolves on the further addition of ether. Germol is volatilized by heat, and leaves no ponderable residue. Its boiling-point is 190° C., and its specific gravity 1.045. When 10 Cc. of it and 60 Cc. of a 10 per cent. potassa solution are shaken together in a 100 Cc. flask, and, after standing 1½ hours, 15 Cc. of hydrochloric acid and 15 Cc. of a concentrated sodium chloride solution are added, a deep-brown, oily layer separates immediately, in which, when largely diluted with water, the addition of ferric chloride produces a grayish-green, transiently violet, and, finally, dirty-brown coloration, accompanied by the simultaneous precipitation of similarly-colored flakes. It is stated that a 1 : 1,000 solution of germol still possesses the power to noticeably check bacterial development.—Merck's Report, Sept. 1, 1896, 454; from Pharm. Ztg., xli., 413.

Hermiline—A New Antiseptic.—Under the name "hermiline" the electrolyzed sea water employed in Hermile's sanitary process is now being recommended in Paris as an antiseptic and disinfectant, Dr. Carlier, Dr. Chantemisse and Dr. Proger speaking very highly of it. The latter, in a communication to the Académie de Médicine, says that it is neither caustic nor irritating, may be applied to the mucous membrane as freely

as to the skin, instantly removes all bad odors, and stops all putrescent fermentation. Compared with other preparations, hermiline is said to kill microbes more effectually and rapidly, whilst it cleanses fetid wounds and sores, hastens healing, and is an ideal antiseptic.—Pharm. Journ., July 18, 1896, 52.

Mydrin—A New Mydriatic.—Cattaneo calls attention to a new mydriatic, which possesses the advantage over other mydriatics in use in that it acts more quickly, has no effect on accommodation, and has only a short action. It is a mixture of 100 parts of *ephedrine* (the active principle of a Japanese gentian, whose mydriatic properties have been known and utilized for the last ten years) and 1 part of *homatropine*, and constitutes a white powder, which is easily soluble in water, and gives rise to but slight irritation when used in 10 per cent. solution.—Chem. and Drug., Sept. 12, 1896, 425; from Brit. Med. Journ. Epit., 29.

Mydrol—A Non-Poisonous Cardiac and Mydriatic.—Barbino gives the name of "mydrol" to the iodo-methyl-phenyl-pyrazolon, which is described as a white, inodorous powder of bitter taste, freely soluble in water or alcohol, but insoluble in ether. It reduces the pulse and causes dilatation of the pupil, but is stated to be non-poisonous and not productive of disagreeable effects.—Pharm. Centralh., 1896, 718.

Peronin—A New Cough Remedy.—A new remedy for the cough of consumptives has been introduced under the name of "peronin." It is said to be the hydrochlorate of the benzyl-ether of morphine, and is given in doses of 0.02 and 0.04 gm. in solution or pills.—Ztschr. Oest. Apoth. Ver., Jan. 20, 1897, 54.

Pseudodiphtherin.—According to A. Kremel, this is composed of honey containing about 5 per cent. of ferric oxide.

Naphthosalicin—Preparation and Uses as a Disinfectant.—L. Cuntz recommends "naphthosalicin" for the washing of clothes as a disinfectant and for disinfection on a large scale. It is obtained by dissolving naphthol and salicylic acid in boiling borax solution, or in fifty times their weight of ammonia water. The solution so obtained is miscible in all proportions with cold water.—Pharm. Post, Feb. 28, 1897, 113.

Neuralginum Carbucicchio—A New Antifebrin Combination.—Under the name "Neuralginum," P. Cabucicchio has introduced a mixture composed of antifebrin, sodium salicylate, and caffeine. It is favorably recommended for the treatment of headache, acute and chronic rheumatism, and as an antipyretic in pneumonia, typhus, etc. The dose varies from 0.5 to 1, and 2 to 3 grammes.—Zeitschr. Oest. Apoth. Ver., July 20, 1896, 553.

Salubrol—A New Iodoform Substitute.—It is stated that by the action of bromine upon methylenbisantipyrin, a nearly odorless, permanent powder is produced, which possesses antiseptic properties similar to iodoform,

and dependent upon the slow elimination of bromine when brought in contact with organic substances. It is marketed under the name of salubrol. It is found to be non-poisonous, and is applied to wounds both in form of 20 per cent. gauze and as a dusting powder. In the latter form it produces a brief, transient pain and burning sensation, but has a non-irritant effect upon the skin.—Ztschr. Oest. Apoth. Ver., Jan. 10, 1897, 29.

Spinol—A Dietetic Remedy from Spinach.—Under the name of "spinol," Stroschein has introduced a brown, syrupy, permanent fluid, which is stated to be prepared from the leaves of spinach, and to contain both iron and phosphoric acid. It is recommended as a dietetic.—Zeitschr. Oest. Apoth. Ver., Aug. 1, 1896, 573.

Tannalbin—Remedial Value.—Dr. Engel has experimented with tannalbin in forty cases of intestinal lesions, such as nephritic and tuberculous diárrhœa, and in cases of debility of convalescence. In all satisfactory results were obtained. It was given to adults in doses of 1 gramme, in a cachet, repeated twice to four times daily; to children half a gramme was given from once to three times in twenty-four hours; the drug was well tolerated in every case.

Tannigen—Value in Infantile Diarrhœa.—Dr. Escherlich confirms the favorable reports of Dr. Moncorvo and others on the value of "tannigen" in infantile diarrhœa, finding it particularly serviceable in cases where a considerable amount of mucus is excreted. Its use must not, however, be abandoned too soon in cases of chronic enteritis of the large intestines.—Pharm. Journ., July 11, 1896, 28; from Therap. Wochenschr.

Urisoloin—A New Diuretic.—J. Mahl has introduced a compound of chemically pure urea and acid lithium-citrate under the name of urisoloin. It is believed to possess powerful action as a physiological diuretic and solvent of uric acid, and is given in doses of 0.2 Gm. in form of tablets every three hours in cases of gout, gravel, cirrhosis of the liver, etc.—Zeitschr. Oest. Apoth. Ver., Aug. 1, 1896, 573.

Virol—A Substitute for Cod Liver Oil.—Under the name of "virol," a preparation containing iron and free fat is being marketed as a substitute for cod-liver oil, and is recommended as being particularly useful as a nutrient for children. Its exact composition is not given.—Zeitschr. Oest. Apoth. Ver., Aug. 10, 1896, 600.

MATERIA MEDICA.

A. VEGETABLE DRUGS.

GENERAL SUBJECTS.

Crude Vegetable Drugs—Chemical Changes.—Karl Dieterich has studied the chemical changes that occur in drugs during the processes which they undergo before being put on the market. He considers these under four divisions, viz.: (1) those drugs which are usually not dried, but possess their maximum efficacy in the fresh condition; (2) those which are dried to augment their keeping qualities, and which necessarily involve a chemical reaction; (3) those in which drying, besides preserving, either causes the presençe or increases the amount of active ingredients; and (4) thòse which are subjected to further manipulation in order to give them a valuable place in the materia medica. He infers from his observations that oxidation is the chief factor in all the changes that do occur, whether allowed by design or by accident. He points out that if we consider the differences of the soil from which plants draw their nourishment, and if we consider that under certain circumstances the oxidation will be carried further than under others, we need not wonder at the lack of uniformity in the same drug from different sources. He is therefore convinced that the study and development of this branch of pharmacy will yield far more than theoretical results, and that the analysis of fresh and dried drugs at different stages will be of great practical advantage in directing the proper manipulations to be employed in producing uniform and superior products. —Pharm. Journ., June 19, 1897, 529–530; from Ber. Deut. Phar. Ges., 1896, 335.

Vegetable Drugs—Histology and Pharmacognosy.—Alfred R. L. Dohme has contributed a valuable series of articles upon the histology and pharmacognosy of some of our more important drugs to present to the eye of the pharmacist pictures of these drugs drawn by him from nature, as they appear under the microscope. This will enable them to be distinguished definitely from one another, and hence from adulterations and foreign admixtures. In connection with this he gives the various organs of the plant wherever possible, and those characteristics which distinguish them. In connection with their histology such salient points regarding their pharmacognosy as may serve to bring out their peculiarities are given, both as to active principles and their location in the plant, as well as to other ingredients that possess interest and value. The effort has been made at a botanical classification, the drugs being, confessedly, taken up at random. Unfortunately these articles do not admit of much condensation, and reference can simply be made here to the drugs considered in

the different articles, which are accompanied by numerous cuts showing in some cases cross- and longitudinal sections, and in the case of leaves sometimes the cross section of the stem as well as the leaf. The following subjects may be referred to in the original articles in the "Druggists' Circular," the month and page being indicated in each case:

Cannabis Indica, leaf. Nov., 1896, 275.
Pareira Brava, root. Dec., 1896, 298.
Cinchona, bark. Dec., 1896, 298–299.
Belladonna, leaf. Jan., 1897, 4.
Duboisia Myoporoides, leaf. Jan., 1897, 4.
Digitalis, leaf. Jan., 1897, 4.
Stramonium, leaf. Jan., 1897, 4.
Lycopodium, grains. Jan., 1897, 5.
Kamala and Wars, glands. Jan., 1897, 5.
Valerian, root. Jan., 1897, 5.
Jalap, root. Jan., 1897, 6.
Henbane, leaf. March, 1897, 64.
Senna, leaves. March, 1897, 64.
Prickly Ash, bark. March, 1897, 65.
Buchu, leaves. April, 1897, 100.
Nux vomica, seed. May, 1897, 126.
Squill, root. May, 1897, 126.
Aloes. May, 1897, 126.
Rhubarb, root. May, 1897, 127.
Sanguinaria, root. June, 1897, 149.
Aconite, root. June, 1897, 149.
Jaborandi, leaf. June, 1897, 149.

Powdered Drugs—Microscopic Features.—B. E. Nelson communicates an excellent paper, accompanied by numerous illustrations, upon the principal microscopical features of a few of the drugs which nowadays are often known to the pharmacist only in a comminuted condition. The list embraces sarsaparilla, licorice, rhubarb, ipecac, stillingia, rhatany, calumba, valerian, curcuma, sanguinaria, ginger, calamus, jalap, aconite, cinchona, cascara sagrada, witch-hazel bark, wild cherry, sassafras, quillaja, cinnamon, stramonium (leaves), digitalis, senna, belladonna (leaves), tea, coca, peppermint, hyoscyamus, flax-seed, cardamom, nux vomica, strophanthus, mustard (containing turmeric), coffee (chicory and bean starch), clover, grindelia, arnica, etc. Unfortunately Mr. Nelson's paper cannot be profitably condensed, and reference must therefore be had to the original, in Merck's Report, running through several months, from October, 1896 to January, 1897, inclusive.

Medicinal Plants—Synopsis of Some Indigenous to Nebraska.—Mrs. Belle C. Heilman, at the meeting of the Nebraska Pharmaceutical Asso-

ciation, 1896, read a paper on the medicinal plants indigenous to Nebraska. All the six great branches of the vegetable kingdom are represented in Nebraska flora. Fourteen out of fifteen classes, forty-three out of fifty-five orders, and about one hundred and ninety-three families, or one-half of all. Nebraska has about three thousand and thirty-two species of plants —not quite 2 per cent. of the whole world—and of these a goodly number are found in the Pharmacopœia, and are listed by the author. Mrs. Heilman further observes that while the scientific view of these subjects presents the most dignified side, yet the domestic side is of no small significance. Many of the commonly miscalled "weeds" have been found good food plants, and are served in various ways under the general designation "greens."—Proc. Neb. Pharm. Assoc., 1896, 48–52.

Cuban Medicinal Plants.—Prof. Robert Combs, while on the island of Cuba collecting botanical specimens during the years 1895 and 1896, had his attention repeatedly called to the great number and variety of medicinal plants, and plants used as domestic remedies. He has obtained considerable information from the country people concerning their use, which, though entirely empirical, led him to the conclusion that many of the domestic remedies employed by the Cubans must have real medicinal virtues. He now communicates the results of his inquiries in "Pharmaceutical Review," two installments being contained in the May and June numbers of that journal (pp. 87–91 and 109–112). The paper cannot be profitably condensed, and reference must therefore he had to the original.

Plants—Action of Light on the Diastase in the Foliage.—According to the observations of Brown and Morris the quantity of diastase in foliage leaves undergoes considerable variation during the twenty-four hours of the day, being greatest in the early morning and least in the evening, particularly after several hours of sunshine. During the past three years, Prof. J. Reynolds Green has carried out a series of experiments to ascertain the nature of this change, and he has recorded his experiments and results in detail in a paper read before the Royal Society. These have led to the conclusion that there exists in the leaf and in the various extracts examined a certain amount of zymogen which is converted by the infra-red and the red, orange, and blue rays into active diastase; but that the violet and ultra-violet rays cause a destruction of the diastase, or at least such a change in the configuration of its molecule that it is unable to effect the hydrolysis of starch.—Pharm. Journ., June 19, 1897, 528, 529.

Plants—Formation of Proteids.—T. Kosntany states that leaves contain a somewhat larger amount of nitrogen by night than by day, there is a larger proportion of ammoniacal salts, and the amount of proteids is not reduced. On the other hand, the amount of nitrates is larger in the daytime. From these facts it would appear probable that the nitrogen of the nitrates is converted into proteids more by night than by day. No aspar-

agin could be detected in the night, this substance being probably converted into proteids. The net result obtained is that the raw materials for the production of proteids are absorbed by the plant chiefly in the daytime, but that the final processes take place chiefly by night.—Pharm. Journ., May 1, 1897, 570; from Landwirtsch. Versuchs-Stationen xlviii., 13.

Plants—Assimilation of Nitrogen.—E. Laurent, E. Marchal and E. Carpiaux have made a series of experiments on the assimilation by the higher plants of the nitrogen contained in ammonia and in nitric acid. From their results it appears that assimilation of nitrates does not take place in the dark, the action of the ultra-violet rays being necessary for the process. For the assimilation of ammoniacal salts, the action of the same rays is of predominant importance, but the luminous rays may incite a feeble assimilation of ammonia in etiolated leaves. The action of chlorophyll is declared to be not essential; etiolated leaves assimilate ammoniacal nitrogen even better than green leaves. The assimilation of nitric nitrogen gives rise to a temporary production of ammonia.—Pharm. Journ., April 3, 1897, 289; from Bull. Acad. Roy. Sci. Belgique, xxxii., 815.

Green Plants—Assimilation of Organic Nourishment.—Dr. T. Bokorny states that the simpler the composition of organic substances, the more readily are they assimilated by green plants. Thus CO_2 is readily converted into $C_6H_{12}O_6$, while plants are unable to produce a carbohydrate from glycerin $C_3H_8O_3$. As a general rule, compounds with one atom of carbon are readily assimilable, the difficulty increasing with the increase in the atoms of C. Substances which are composed of C and H only are not so favorable as those which consist of C and O only, or of C, H and O. Peptone is a peculiarly excellent food material for fungi, and possibly also for algæ.—Pharm. Journ., May 1, 1897, 370; from Biol. Centralb., 1897, 1.

Plants—Formation of Secretions.—Dr. A. Tschirch states that resin, oil and other secretions are never found within the cell-membrane of plants, but in a special layer known as the resinogenous layer. The septa which occur in the vittæ of umbelliferæ are the remains of this layer. To the substance of which this layer is composed the author applies the term "vittin." It is of a pectinaceous character, and appears to be identical with the substance of mucilage. In schizolysigenous passages, like those of the rutaceæ, there is first a cap-like formation of the resinogenous layer, followed by a dissolution of the cells and a resorption of the protoplasm.—Pharm. Journ., April, 1897, 289; from Sitzber. 68 Versammlung deutscher Naturforscher u. Aerzte, 1896.

Ash of Plants—Estimation in Various Drugs.—Charles H. La Wall communicates the results of ash determinations made at different times upon a large number of drugs, embracing many that are most frequently

employed in medicine. These tabulated results embrace three pages of the journal in which they are published, and space cannot therefore be given here, but they will, doubtless, prove valuable to those engaged in the studies concerning the identification of drugs, since certain groups show marked peculiarities in the amount of ash present. With this idea before him, the author contemplates making occasional contributions in the future. —Amer. Jour. Pharm., March, 1897, 137–142.

Active Principles of Plants—Localization.—M. L. Sauvan, in a series of articles, gives the results of his observation on the distribution of a number of alkaloids and glucosides in the living plant. Strychnine occurs in *Strychnos nux vomica* and in other species of the genus, in the cortical parenchyma and liber of the stem and root, both in old and in young plants; in the parenchyma of the leaves and liber of the veins; and in all the cells, both of the embryo and of the endosperm, in the ripe seed, always in their interior. Brucine accompanies strychnine in all the organs where it occurs, in the various species of *Strychnos;* it is also present, in smaller quantities, in the epiderm of the leaf and of the young stem. Curarine is found, in various species of *Strychnos*, in the interior of the cortical parenchymatous cells, and in those of the liber, in the root and stem; also in the epiderm of the young stem, and in the cells of the parenchyma, liber, and epiderm of the leaf. The localization of gelsemine in *Gelsemium sempervirens* was found to be in the cortical parenchyma and liber of the root, stem, leaf-stalk, and leaf, also in the pith of the stem. Berberine occurs, in *Berberis vulgaris*, in the interior of the cells of the cortical parenchyma, liber, cambium, and medullary rays, and in the interior and the walls of the xylem vessels in the root, in the interior of the cells of the cortical parenchyma, liber, and cambium of the stem; and in all the cells of the embryo and endosperm. The toxine of the yew is found in the parenchymatous and pericyclic cells of the root, but not in the sieve-tubes; in the same elements and also in the pith of the stem; in the epiderm and the pericyclic and liber cells of the leaf; in all the cells of the embryo and endosperm of the seed. Helleborine and helleboreine occur in the same organs, but not usually in the same cells of various species of *Helleborus*. *H. viridis* is the richest in helleborine; *H. niger* in helleboreine. Daphnine occurs especially abundantly in the fruit of *Daphne alpina* and *D. gnidium*.—Pharm. Jour., Aug. 29, 1896, 177; from Journ. de Bot., 1896.

Fruits—Preservation for Exhibition Purposes.—Geo. F. Payne gives some practical directions for the preservation of fruits for exhibition purposes. He says it is possible to preserve the most delicate fruits and berries, but it is a matter of extreme difficulty to cause them to retain, at the same time, all of their magnificent coloring, as well as to prevent either their shrinking or bursting. To preserve the natural size of some fruits, it is important to prepare a preserving fluid of the same specific gravity

as the juice or must of the fruit. A must spindle, or other specific gravity spindle for liquids heavier than water, can be used for this purpose. The juice of the fruit should be squeezed out and its gravity taken, and the preserving fluid should be made to correspond with it by the addition of sugar. A beer saccharometer, which can be purchased for 75 cents, is well suited for taking the specific gravity of the juices of the fruits. Each degree upon its stem represents one ounce of sugar in each 100 ounces of the solution, when made up with water. A gallon of water contains 128 fluid ounces, or weighs about 133½ avoirdupois ounces; hence each degree on the spindle indicating 1 per cent. of sugar, or one ounce in the hundred, will mean 1⅓ ounces of sugar in the gallon. Then a juice of ten degrees is equivalent to 13⅓ ounces of sugar in the gallon. Test the gravity of your solutions after mixing to see that you are correct. The less the gravity of the solutions, the more inclined will be the fruits with skins to swell; so a little shortage on the sugar is only inclined to make the fruit look large; too little sugar may cause them to burst. The specific gravities of the juices of fruits vary considerably for the same fruits, and must therefore be determined in each case; but where one cannot secure enough juice or must to take the specific gravity, it can be fairly approximated by assuming the gravity of some similar fruit. In making up the solutions it is advisable to use distilled water if it can be secured, and if not accessible, rain-water freshly caught in a clean tub or barrel will be excellent. Pure spring water or artesian water, boiled and cooled, in most cases will be probably next best. If well water is used it should also be boiled and cooled. All fruit before being put into the containers should be washed gently in pure water; after being placed in the bottles, let it drain a few minutes, then pour off the water and add the preserving fluid. If a half or an inch layer of melted paraffin is slowly poured on top of the fluid, it will harden and make an excellent top covering.

The author has experimented with a large number of preservatives, but finds the following to serve the purpose in most cases: Salicylic acid and sodium salicylate, for peaches, plums, cherries and currants; sodium bisulphite, for pears and light colored grapes; formic aldehyde for dark colored grapes and dark colored fruits in general; strong, fresh sulphurous acid for apples. For particulars the author's original paper must be referred to in Drug. Circ., Sept., 1896, 208.

Botanical Specimens—Preservation.—H. Bremens recommends the following method for preserving botanical specimens so that they will retain their natural form and color. The plants are air-dried and dipped in a warm 5 per cent. gelatin solution. In case the gelatin does not adhere, the object is first immersed in 70 per cent. alcohol and then in the gelatin solution. After the layer of gelatin has cooled, the object is dipped into a mixture of 20 parts of 40 per cent. formic aldehyde solution and 90 parts of water. By this measure a layer of insoluble gelatin is obtained, and at

the same time all fermenting organisms, bacteria, etc., are destroyed, and the fruits or flowers are said to be preserved in their natural form and color.—Drug. Circ., March, 1897, 66.

ALGÆ.

Algæ—Conditions Affecting their Nutrition.—According to H. Molish, the algæ thrive best in a slightly alkaline nutrient solution, while acid kills them or arrests their growth. These facts have a strong bearing on the growth of fresh-water algæ in streams and in lakes. Waters in which algæ are found most abundantly are slightly alkaline. In the case of those algæ which especially require calcium, this element cannot be replaced by sodium, lithium, rubidium, or cæsium. Potassium arsenate is highly poisonous to algæ, while potassium arsenite is harmless in small quantities.—Pharm. Jour., April 3, 1897, 289; from Sitzber. Akad. Wiss., Wien, 1896.

BACTERIA.

Bacteria—Occurrence in Fossils.—As the result of prolonged work on the indications of bacteria in geological strata, M. B. Renault states that, as might be expected from their simple structure, bacteria appear to have been co-eval with the first appearance of organic life on the earth, the coccoid form being apparently earlier than the bacillon. Indications are found in fossilized bone, teeth, scales, and caprolites, as well as abundantly in vegetable tissues, the spores and sporanges of ferns appearing to have been especially subject to their attacks. The species are, as a rule, distinct from those at present in existence, and are shown in a large number of drawings illustrating the author's paper in Ann. de Sciences Naturelles (Botanique), 1896, 275; Pharm. Journ., Feb. 27, 1897, 162.

Bacteria—Variable Effect of Metallic Poisons upon them.—It has been found by T. Paul and B. Krönig that the different salts of a poisonous metal, such as mercury, are not equally deadly to the spores of the anthrax bacillus, those which are electrolytically dissociated to the greatest extent being most active under otherwise similar conditions. Thus, a solution of mercuric chloride contains many more mercury ions than one of mercuric cyanide of the same concentration, and is correspondingly more deadly, but the addition of sodium chloride to the first solution diminishes the number of mercury ions, and causes a marked loss of bactericidal power. The addition of salt to increase the solubility of mercuric chloride is therefore the reverse of advantageous in preparing antiseptic solutions. Silver salts yield similar results, the nitrate, chlorate, etc., which are dissociated into their ions to a considerable and approximately equal extent in aqueous solution, having nearly the same bactericidal action, while the addition of sodium thiosulphate or potassium cyanide, with which the silver ions combine to form complex ions, practically destroy he bactericidal power altogether. This power, in the case of solutions of

bases or acids, depends, on the whole, on the strength of the base or acid —that is, on its degree of electrolytic dissociation. Silver nitrate exerts its maximum power when dissolved in 50 per cent. alcohol, but in the case of mercuric chloride the maximum occurs at 25 per cent. Solutions of either salt in absolute alcohol are practically without effect on anthrax spores.—Pharm. Journ., Feb. 27, 1897, 162; from Zeit. f. phys. Chem., through Nature, lv., 328.

Moulds and Bacteria—Preparation of Culture Medium.—Smith Ely Jelliffe has examined and gives a description of some moulds and bacteria found in medicinal solutions, and shows the following in illustrations accompanying his paper: *Penicillium crustaceum*, Lk., *Mucor racemosus*, Fres., *Aspergillus repens*, De Bary, *Sterigmatocystis schaceus*, Winter. Other forms which were observed but are not described are: *Sarcina flava*, De Bary, *Staphylococcus pyogenes aureus*, Passet, *Bacillus proteus vulgaris*, and *Bacillus fluorescens liquefaciens*, Flügge. Several practical points have been developed from the author's examination and may here be noted. The first and important one is, that if a solution has a mould developed in it, it is not advisable to filter the solution and return it to the shelf for use, as the active ingredients in the solution have probably undergone some changes. It is wiser to throw the whole solution away and make up a new one. The second practical point is the preparation of the culture medium which was used by the author in the course of his experiments, which is the one suggested by Dr. H. M. Richards, of Barnard College, but for which no method of preparation is given in the ordinary text books: Three or four medium-sized potatoes were selected, washed, pared and cut into pieces and boiled in about one liter of water; after about one half hour's boiling they were mashed and again boiled for one half hour; the liquid was then filtered through cotton and then through paper, and served as the watery basis of the agar. One per cent. of peptone, ½ per cent. of salt and 1¼ per cent. of agar were added to 1 liter of the potato water, and the whole boiled over a free flame for about three-quarters of an hour. The medium was then titrated to determine its reaction, and was brought to react 0.15 acid to phenolphthaleïn. If alkali (NaOH) or acid (HCl) was added, the boiling was continued one-half hour longer. The medium was then filtered through absorbent cotton, sterilized for three consecutive days at 24-hour intervals, and then put into test tubes and sterilized. After the final sterilization the medium was allowed to harden on the slant. This "potato-agar," and the ordinary "glycerin-agar," gave the most rapid and characteristic growths.—Drug. Circ., April, 1897, 94–95.

Bacilli—Effect of Milk on Different Species.—Hesse has found that *cholera bacilli* undergo deterioration in raw milk, and when kept at a temperature of 37° C., are entirely destroyed within twenty-four hours. On the other hand, Carlo and Schottelins have shown that *anthrax bacilli*

flourish abundantly in milk and fully maintain their virulence, and more recently they have observed that *diphtheria bacilli* find an exceptionally satisfactory material for growth and multiplication in fresh milk, though in sterilized milk their growth is less marked.—Pharm. Jour., Feb. 27, 1897, 162; from Cent. f. Bakt.

FUNGI.

Fungi—Kinds Flourishing in Acid Solutions.—C. Wehmer has studied the fungi developing in acid solutions. In dilute solutions of citric acid he found a mycele belonging to *verticillium glaucum.* In solution containing tartaric acid, *citromyces* makes its appearance. *Penicillium luteum* was found when nutrient solutions containing sugar were treated with citric acid. When tartaric acid was used, *aspergillus niger* took its place.—Phar. Jour., April 3, 1897, 289; from Beiträge zur Kenntniss einheimischer Pilze, Vol. 5.

Mould-Fungi—Composition of the Mycele.—Marshall has investigated the composition of the mycele of several typical mould-fungi, *aspergillus niger, penicillium glaucum* and *mucor stolonifer*, and finds that the average percentage of proteid substances is as high as 38, while that of cellulose is only 5.03, and of substances soluble in alcohol, 14.03. In the composition of their mycele mould-fungi occupy an intermediate position between bacteria and the higher plants, containing more nitrogenous matter and less carbohydrates than the latter, more carbohydrates and less nitrogenous matter than the former. As contrasted with the spores, the mycele of *penicillium glaucum* contains a larger amount of proteids, but not nearly so much cellulose, starch or substances soluble in alcohol.—Pharm. Jour., May 1, 1897, 370; from Arch. f. Hygiene, xxviii., 16.

Moulds—Two New Organisms Producing Citric Acid Fermentation.—C. Wehmer has isolated two new moulds in a solution of sugar that had undergone acid fermentation, and regards them as being responsible for the production of the citric acid found in the solution. In appearance these moulds, which he has named

Citromyces Pfefferianus and *C. Glaber* respectively, resemble the common blue moulds, but with practice can be distinguished from them. The most favorable temperature for the germination of the spores is from 18° to 25° C. Below 0° and above 25°, they do not grow. Before budding, they swell to double their size. Under some conditions there is a production of yeast-like cells, which produce a turbidity. As much as 4 per cent. of citric acid has been found in the solutions; if allowed to stand for any length of time, the acid is destroyed. The most favorable temperature is 15° to 20° C.; the production of the acid is easily controlled by regulating the temperature, and removed from further action by the addition of chalk, when calcium citrate is thrown down in crusts. A plentiful

supply of oxygen is, of course, necessary, as in order to convert 50 grams of dextrose into citric acid, 14.3 grams or 10 liters of oxygen are necessary. These two moulds are widely diffused in nature, being found on a number of vegetable products.—Pharm. Era, Oct. 29, 1896, 566; from Ztschr. f. Spirituosen.

Ergot—Constituents.—In continuation of his researches on the constituents of ergot, C. Jakoby finds that the spasmotin or sphacelotoxin obtained by him from ergot is not, as he supposed, a single substance. He has succeeded in isolating from ergot three chemically different bodies, *chrysotoxin*, *secalintoxin*, and *sphacelotoxin*—the latter not to be confounded with the complex body above named. All of these are, however, therapeutically similar.

Sphacelotoxin combines with the inert *secalin* to form

Secalintoxin, and also combines with the inert *ergochrysin* ($C_{21}H_{22}O_9$) to form a

Chrysotoxin that is identical with spasmotin. This latter substance—chrysotoxin—fully represents ergot pharmacologically, and is said to retain its activity unaltered for years; whereas sphacelotoxin and secalintoxin do not.

Chrysotoxin-sodium, which is easily soluble in water, appears to be particularly adapted for use by injection, but clinical data are not yet in evidence.—Pharm. Centralh., 1897, 58.

Mushrooms—Edible and Non-Edible Varieties.—At the November pharmaceutical meeting of the Philadelphia College of Pharmacy, Charles McIlvaine read a highly interesting paper on edible and non-edible mushrooms and fungi, his object being to awaken an interest in the immense field that presents itself in a field of study that, presenting itself everywhere, is practically unoccupied. He observes that while the many and expensive books upon fungi are excellent in their classification and description of toadstools, their authors, following one another in assertion and lack of original investigation, falsify their edible and non-edible qualities. He describes a number of these plants, and states that by study of their botanical characters, and by experiments with reference to their edible qualities, he had been enabled to increase the list of edible fungi to 437 varieties. The only toadstools fatal to man were eight species of *amanita*, the remaining member of this genus, thus distinguished, being regarded as among the finest edible varieties. He places the toadstools among the most valuable of food supplies, and has seen large and paying crops of mushrooms grown on a meadow where pieces of spawn had been inserted in the sod. This inserting should be done after the spring rains are over, and the dry season well set in, as too much moisture will invariably kill the spawn.—Amer. Journ. Pharm., Dec., 1896, 648–663.

LICHENES.

Lichens—Chemical Constituents.—O. Hesse in continuation of a former report on substances obtained from lichens, reports upon a number of lichen acids which he has found in different lichens.

Usninic acid was obtained from *Usnea barbata, U. longissima, Parmelia caperata, Cetraria pinastri, Cladonia rangiferina* and *Placodium saxicolum,* and in all cases was found to have the composition $C_{18}H_{16}O_7$. The same acid had been found in *Cl. rangiferina* by Rochleder and Heldt, whereas Hesse had found a β-usninic acid in the same lichen, which Stenhouse afterwards called

Cladoninic Acid.—A mixture of *Cl. rangiferina* and *Cl. rangiformis* yielded more of this acid, but a closer examination revealed it to be a mixture of the ordinary usninic acid and atranorinic acid, a decomposition product of atranorin. The substance obtained by Paterno and Oglialoro from *Lecanora atra,* also seems to be a like mixture. Atranorin and several other lichen acids, chrysocetraric acid, cetrapinic acid, vulpinic acid, rhizocarpic acid, prosomic acid, etc., are also discussed in this paper.—Pharm. Rev., May, 1896, 94; from Berichte, *30,* 357.

FILICES.

Fern Rhizomes—Comparative Structure.—Dr. Walter Laurén has studied the anatomy of the rhizomes of *Aspidium Filix Mas* and other ferns liable to be confused with it. He regards the number of vascular strands of the leaf stalks, a characteristic on which classifications have frequently been based, to be of doubtful value for this purpose. Microscopic study showed the presence of the internal glandular structures which secrete the medicinally active principles in *Aspidium Filix mas, A. rigidum, A. spinulosum, A. dilatatum* and *A. crystatum.* These glands are lacking in *Athyrium Filix fœmina, Aspidium montanum* and *A. lobatum.* In the latter group, intercellular spaces in the fundamental tissue are also lacking. The secretion appears between the cuticle and the wall of the cell proper, as in the epidermal glands of the Labiates and Composites.

Dr. Laurén describes the form and structure of the chaffy scales found in the above-named species, and has prepared a key for the ready separation of these species, which is based upon their scale characteristics, as follows:

I. Chaffy scales without glands (or, if present, only two at the base of the scale).
   A. Margin of scales entire. *athyrium filix fœmina.*
   B. Margin of scales with long, simple, pointed teeth, *aspidium filix mas.*
   C. Margin of scales exceedingly irregular throughout from large number of teeth present, *aspidium lobatum.*

II. Chaffy scales with glands.

A. Margins with pointed teeth, *aspidium rigidum.*

B. Margins entire,

a. Glandular trichomes uniform, unicellular, at margin only, *aspidium crystatum, A. spinulosum, A. dilatatum.*

b. Glandular trichomes of two types: short, unicellular and large, long pediceled; both at margins and faces of scales, *aspidium montanum.*

—Pharm. Rev., May, 1897, 96; from Schweiz. Wochenschr. f. Chem. u. Pharm., 1896, No. 48.

AROIDEÆ.

Yerba de Manso—Histology of the Leaf and Root-Stock.—Albert Schneider contributes the results of an elaborate histological study of the leaf and root-stock of *anemlopsis californica*, Hook. et Arn. (*houtuyina californica* [Nutt.] B. & H.), the "yerba de manso" of the Mexicans, which, while known to systematists and accurately described by botanists, has not heretofore been studied histologically. The present paper is illustrated with a number of cuts, which can be profitably reproduced only with the unabbreviated text; the results of the author's study being summed up by him as follows:

1. The leaf is typically isolateral in its structure. Stomata occur on both surfaces. A well-marked water-storing tissue is present in the leaf; this also occurs in the stem and runner.

2. Typical spiral and annular ducts occur in the vascular tissue of the petiole and leaf-blade. In the stem, runner, root and root-stock the vascular tissue is represented by large scalariform ducts.

3. The general histological characters of the stem resemble those of the runner. The general histological characters of the root resemble those of the root-stock.

4. Resin-cells occur in the parenchyma of the runner, root-stock and root. They are most numerous in the root.

5. Two kinds of resinous substances occur; one is of a pale-amber color and occurs within the cells; the other is of a bright cherry-red color and occurs in the larger intercellular spaces of the root and root-stock.—Drugg. Circ., May, 1897, 122–123.

GRAMINACEÆ.

Barley—Process of Germination.—J. Grüss states that when barley germinates the solution of the cell-walls of the endosperm commences in the neighborhood of the scutellum, and advances thence towards the apex of the grain, most actively in the outer part; but there is a small portion of the apex which usually remains intact. The cell-walls are not dissolved,

but corroded. Congo-red stains intact walls an intense red, while those that have been affected assume only a slight light-red tint. The starch-grains are attacked only after the corrosion of the cell-wall, and first in the neighborhood of the scutellum. Diastase may be produced spontaneously in the endosperm of seeds that have not germinated, and from which the embryo has been removed.—Pharm. Journ., Feb. 27, 1897, 163; from Wochenschrift für Brauerei, 1896.

Barley—Germination.—T. C. Day communicates the results of a series of observations on the germination of barley with restricted moisture. He finds that an increase of moisture during germination always induces a corresponding increase in the amount of carbon dioxide produced. Taking the production of carbon dioxide as the measure of the rate of growth during germination, the period of greatest activity, with varying quantities of moisture, is generally about the third or fourth day.—Pharm. Journ., April 3, 1897, 290; from Trans. Bot. Soc., Edinburgh, xx., 492.

Andropogon Sorghum—Enormous Amount of Potassium Nitrate in the Plant.—The "Agricultural Ledger" (India, 1896, No. 26) calls attention to the enormous percentage of potassium nitrate contained in the stems of this plant, known under the name of

Juar, and used in the Punjaub as fodder. This fodder having proven poisonous to animals at certain seasons, usually when the plant becomes stunted and dried up owing to the absence of rains, it was subjected to analysis, and potassium nitrate was found to the amount of 75 grains per ounce weight of the plant. Animals drenched with a solution of 8 ounces of the salt died within twenty minutes after administration, with the same symptoms.—Pharm. Jour., Oct. 31, 1896, 380.

PALMACEÆ.

Areca Nuts—Poisonous Characters.—The powdered nut of *areca catechu* is largely used in veterinary practice as a tænicide. Dr. Ernest H. Cooke calls attention to the poisoning of some 5 months old "dachshund" puppies. About 56 grains of the powder was added to a half a teacupful of castor oil, and administered to four of these, in equal portions, so far as could be ascertained. Two of the puppies were saved by the administration of salt and water as an emetic; the other two died. An examination of a portion of the powder used did not reveal any constituent foreign to the areca nut.—Chem. News, Dec. 18, 1896, 295.

Cocoanuts—Composition of the Milk, etc.—"Science" gives the following as being approximately the composition of cocoanut milk: Fatty saponifiable matters 35 per cent., casein and albumen 2 per cent., earth and phosphates 0.5 per cent., sugar 3 per cent., and substances not estimated 2 per cent. The remainder is water. Besides considerable nutritive value, the fruit furnishes a certain proportion of cocoanut oil that may be considered to bear a somewhat similar relationship to the vegetable

milk that ordinary butter does to the milk that is obtained from cows. A kind of sugar that is known as "gaggheng gaggheng" can also be extracted, which forms, when mixed with lime, a powerful cement, resistive of moisture, capable of enduring great heat, and susceptible of a brilliant polish. It is also well known that the fermentation of cocoanut milk gives rise to a potent alcoholic spirit analogous to arrack. Cocoanut oil is largely used in the manufacture of marine soap, which forms a lather with sea-water.—West. Drug., May, 1897, 207.

Saw Palmetto—Examination and Characters of the Fixed Oil of the Fruit.—See *Oil of Saw Palmetto* under "Organic Chemistry."

COMMELINACEÆ.

Yerba Del Polo—A Powerful Mexican Hemostatic.—Alfonso Herrera calls attention to "Yerba del Polo," a name which appears to be applied in Mexico to several plants of the family *Commelinaceæ*, and which has been valued on account of its remarkable activity in stopping the blood from wounds by the Mexican Indians since before the Conquest. According to Hernandez, who calls these plants Matlaliztic prima, secunda, texcocana, tercia, asphodelea, and coapatli, the Aztecs used the Yerba de Polo to cure fevers, headaches, tumors and hemorrhages, and three centuries later Alzate again made known to his countrymen the remarkable properties of this drug; but the plant remained unnoticed, until in 1863 the works of Hernandez and Alzate began to be read, when interest began to be revived in it, physicians were induced to use it, and investigations were made to determine its active constituents by Prof. Herrera. The author names the following plants and synonyms for Yerba de Polo:

Commelina tuberosa, Linn.; *C. parviflora*, Reichl.; *C. undulata*, Lodd.; *Matlaliztic*, *Coapatli*, *Zoyol*, *Xochitl*, and *Rosilla*. They grow in the Valle de Mexico and Orizaba, on the sandy banks of rivers and brooks, and flourish from July to September. Subjected to proximate examination the drug was found to contain free acetic acid in the juice, and in the extract obtained from the juice, ammonium acetate, potassium chloride, albuminoids, vegetable albumin, chlorophyll, extractive and cellulose. The author gives some consideration to the probable cause of its hemostatic action, and hazards the following theory, which, though not invulnerable, may perhaps lead to an explanation of the physiological fact: "Applying on a broken vessel the powder of the plant, in a cataplasm, or a concentrated solution of the extract, the proteid principle of the herb mixes with the blood, whose alkali reacts upon the former and affords a separation of ammonia; this reacts upon the vessels, irritating their tissue and contracting them, as Béclard observed; for it constitutes a very dilute alkaline solution, and has hemostatic properties sufficient to produce a complete obliteration of the vessel."

Professor Herrera lays particular stress upon the ease with which the

proteid substances in the juice furnished ammonia on the application of heat; hence the observance of acetic acid in the free state in the juice, and its presence as ammonium salt in the extract obtained by evaporation of the juice. The remedy has been used with marked success as a kind of hemostatic in the treatment of metrorrhagia and hemoptysis, and as a general hemostatic in capillary hemorrhage. In the *first* case it is used as an injection (1 to 8 drachms to the pound); in the *second*, as pills (of 1 to 2 grains); and in the *third* case in the form of cataplasm made from the powder, or in concentrated solution of the extract applied on lint.—Amer. Jour. Pharm., June, 1897, 290–294.

LILIACEÆ.

Aloes—Determination of Aloin.—Schäfer has obtained from 15 to 30 per cent. of well crystallized, light yellow aloin from various kinds of commercial aloes, by the following process: 50 Gm. of aloes are dissolved in 300 Cc. of hot water, slightly acidulated with a few drops of hydrochloric acid. The solution, after standing for the resins to separate, is poured off and mixed with 50 Cc. of 20 per cent. of ammonia solution. This is followed by a solution of 15 grammes of calcium chloride in 30 Cc. of water. On stirring rapidly the aloin-calcium compound separates out, and after standing fifteen minutes is collected and drained, or separated in a centrifugal machine. The drained mass is mixed in a mortar with a slight excess of hydrochloric acid, the resulting mixture of calcium chloride and aloin dissolved in the smallest possible quantity of boiling water, filtered, the filter washed with a little boiling water, and the filtrate crystallized at a low temperature by means of ice—Pharm. Journ., April 3, 1897, 287; from Ph. Zeit. Russl., 1897, 65.

Aloes—A New Reaction Suitable for Forensic Determinations.—Pierre Apéry, referring to the methods heretofore proposed for the identification of aloes in mixture, observes that, inasmuch as aloes is occasionally used criminally—as an emmenagogue to produce abortion—none of these are sufficiently delicate for forensic examinations. He therefore proposes the following reaction, which depends upon the production of a red-brown color by dilute ferric chloride solution under the conditions given: The preparation to be examined is extracted with alcohol, the filtrate evaporated to dryness, the dry residue extracted with water, filtered, the filtrate precipitated with lead acetate, filtered again, the excess of lead acetate removed, after concentration, with sodium carbonate, and, after filtering for the last time, neutralizing the resultant-liquid with acetic or nitric acid. Upon adding a few drops of dilute ferric chloride solution, a distinct red-brown color is produced even in dilutions of 1 part aloes in 2000 or 3000 parts of water. It is true that other substances, containing tannins or phenols as shown by Brouardel, such as kola nuts, areca nuts, pambotano, etc., also yield a brown-red coloration under the conditions named; but

none of these tonic agents are likely to be employed in conjunction with aloes, drastic remedies, such as savin, absinthium, and cathartic gum-resins, being usually so combined.—Ztschr. Oest. Apoth. Ver., Oct. 10, 1896, 766–767; from Proc. Soc. Imp. de Med., Constantinople.

Crinum Asiaticum var. toxicarium, Herbert—Medicinal Use.—Prof. Hartwich calls attention to the medicinal value of the bulbs of *Crinum Asiaticum var. toxicarium.* This handsome plant with beautiful flowers is found wild in India and the Moluccas, and is cultivated as a favorite in Indian gardens. The bulbs principally find use, as in the specimen at hand, cut into narrow strips. They are used as emetic and diaphoretic, and are noted by Flückiger and Hanbury as a substitute for squill.—Pharm. Rev., Oct. 1896, 233.

Onions—Occurrence of Quercetin in the Outer Skin.—As long ago as 1825, Zeuch described the dyeing properties of the outer skins of the bulb of the onion (*Allium cepa*). Perkin and Hummel have now determined this coloring matter to be *quercetin*, which they have succeeded in isolating in the form of glistening yellow needles. They established its identity by an ultimate analysis both of the substance by itself, of its sulphuric acid compound and its acetylation compound, and by obtaining phloroglucin and protocatechuic acid as the principal products on decomposing the latter with fused alkali. Moreover, with mordants, it dyed shades similar to those given by quercetin from quercitron bark, while comparative experiments showed it to be quite equal to that of such well-known dye-stuffs as fustic and quercitron bark.—Amer. Journ. Pharm., Oct. 1896, 568; from Proc. Chem. Soc., 1896.

BROMELIACEÆ.

Chagual Gum—Source and Characters.—The growing scarcity of acacia gums from the Upper Nile and Soudan, and the increasing demand for gums in various technical operations has made it necessary to search for and investigate gums from other sources with the purpose of their adaptability as substitutes. Prof. C. Hartwich contributes the results of some researches made respecting the "Chagual gum"—also called "Maguey gum"—of Chili. This is derived from several specimens of *Puya*, among which *Puya chilensis*, Mol., has been mentioned prominently as the principal source of the gum, the other two being *Puya lanuginosa*, Schult., and *Puya lanata*, Schult. Wiesner has already called attention to the improbability that *P. chilensis* is the true source of the commercial gum, and this view is supported by the present researches of Prof. Hartwich, though he appears to be unable to decide upon the identity of the species of Puya yielding it. It is an interesting fact that the gum is formed in the plant through the influence of a caterpillar—*Kastina elegans*—the bite of which causes the exudation of the gum upon the plant.

The gum occurs in hollow cylindrical pieces from 0.2 to 1.5 Cm. in thick-

ness, occasionally having the form of stalactites or irregular tubers, but in nearly all cases showing the impression of the epidermis to which they have been attached. On their inner surface they are longitudinally streaked, while their outer surface is usually numerously fissured, the fissures penetrating deeply toward the interior. In the absence of these the pieces are of glassy brightness, transparent, and of very dense structure internally. The color varies from colorless, through yellowish and brownish to a tolerably deep brown, isolated pieces being almost black. The largest pieces observed by the author weighed from 40 to 50 Gm. From an average sample cold water dissolved 5.04 per cent.; when boiled for some time, 17.54 per cent. was dissolved. Of selected pieces the black were simply disintegrated to a granular mass when macerated in water; the brown pieces yielded to boiling water about 5 per cent.; the clear, faint yellowish pieces yielded 4.12 per cent. to cold, and an additional 37.08 per cent. to boiling water, while the nearly colorless, glassy-transparent pieces, dissolved in cold water completely, leaving only an insignificant residue of epidermal matter adhering when the gum was detached from the plant.

The differences observed in the adhering plant fragments lead the author to the opinion that the gum is collected from different species of *Puya*, and that a demand for the gum may result in a more careful selection by the gatherers. Experiments made by Prof. Guehm concerning the adaptability of the gum for technical purposes (calico printing, *i. e.*), show the average samples to be unsuited, while the clear, nearly colorless pieces, when made into a concentrated mucilage by prolonged heating, answered the purpose satisfactorily.—Zeitschr. Oest. Apoth. Ver., Aug. 1 and 10, 1896, pp. 565–570 and 594–598.

IRIDACEÆ.

Saffron—Cultivation in Malaga.—According to a British Consular Report, the price of saffron seed varies in Malaga in proportion to the price of saffron itself. The ground is lightly prepared in August to a depth of 15 Cm., the seed planted about 8 Cm. deep, in rows 20 Cm. apart, with 1 or 2 Cm. between the seeds. There is no fruit until the second year, and after the sixth year it is customary to renew the plantation. Gentle hoeing is necessary in summer, and the soil must be loosened with a special tool before the plants are moved at the end of September. Soil in which the plant grows for the first time gives the best results, and the richer the soil the better the return. The flower is picked during the latter half of the month of October, and the product, after drying on sieves over a slow fire, is divided into nine classes, the prices of which vary according to the quantity of each class that the crop yields and the demand for the same.—Pharm. Journ., July 25, 1896, 64.

Orris Root—Proximate Analysis.—S. Allen Tucker has subjected orris

root—selecting the granular form of commerce—to proximate examination, with the following results:

Petroleum ether extract; wax and fat	1.34 per cent.
Ethyl ether extract; odorous matter soluble in alcohol and benzol	1.83 per cent.
Absolute alcohol extract, about three-fourths soluble in water.	4.13 per cent.
Distilled water extract; 8.31 per cent. glucose, 1.27 per cent. sucrose	14.02 per cent.
Alkaline (sodium hydrate) extract; mucilage, albumen	30.30 per cent.
Acid (hydrochloric) extract	10.30 per cent.
Moisture	8.74 per cent.
Ash	2.12 per cent.

Starch was present to the amount of 16.85 per cent.; cellulose and undetermined substance, 10.37 per cent. A cold infusion gave no precipitate with gelatin for tannin.—Amer. Jour. Pharm., April, 1897, 199–200.

MUSACEÆ.

Banana—Composition and Food Value.—John B. Coppock has analyzed a sample of a flour made from *musa paradisiana*, one of the banana tribe, with the following results: Water, 10.62; albuminoids, 3.55; fat, 1.15; carbohydrates, 81.67; fibre, 1.15; phosphoric acid, 0.26; salts other than phosphates, 1.60 = 100.00. This analysis shows it to be a starchy food, but one of the most striking features of this natural product is the solubility of the carbohydrate portion; with only warm water the whole of it forms quickly a thin mucilage, which is apparently very digestible. The extreme solubility of this flour is further emphasized by the fact that it not alone constitutes an important food product throughout the island of Cuba, but that it has long been used in the island as a food or gruel for infant feeding just leaving off breast feeding, despite its being essentially a starchy substance. The flour has the appearance of finely-ground oat-meal, but possesses a distinct odor of an agreeable nature. The fairly large percentage of phosphoric acid in this flour enhances its value as a nutrient. It is closely related to the ordinary banana, *musa sapientum*, the latter being distinguished by the larger size, sweetness and succulent nature of the fruit.—Chem. News, June 4, 1897, 265.

AMOMEACEÆ.

Commercial Gingers—Percentages of Oleo-Resin.—W. S. Glass, with the object of obtaining a satisfactory "Essence of Ginger," examined samples of Jamaica, Cochin and African gingers, and found them to yield respectively and in the order named, 5.00, 4.33 and 8.075 per cent. of oleoresin; 5.3, 4.6 and 5.5 per cent. of ash; and they lost 9.33, 11.00, and 8 per cent. of moisture on drying. In 1879, Thresch had obtained from three samples of the same varieties of ginger, 3.200, 4.965, and 8.075 per

cent. respectively; Frank Siggins in 1888 (see Proceedings, 1888, 311), had obtained from Jamaica ginger, 5 per cent., and from two African samples, 6.17 and 7 per cent.; while Riegel (see Proceedings, 1892, 762), had also obtained 5 per cent. of oleo-resin from a sample of Jamaica ginger.—Pharm. Journ., Mar. 20, 1897, 245.

Ginger—Effect of Solvents on the Analytical Character.—J. F. Liverseege has contributed a paper to the Brit. Pharm. Confer. (1896), in which he gives the results of experiments made to provide means of testing whether a sample of ginger was spent or not, as waste products were sometimes put on the market. By methods which are described the author subjected a sample of ginger to the course of examination indicated in the table, the results under I. being obtained with the original ginger, while those in columns II., III., IV. and V., were obtained with a portion of the same ginger which had been previously exhausted by certain solvents; II., with rectified spirit; III., with proof spirit; IV., with 25 per cent. proof spirit; and V., with water.

	I.	II.	III.	IV.	V.
Ash soluble in water	2.4	2.2	1.7	1.1	1.0
" " HCl	1.8	2.1	1.8	1.5	1.4
Ash insoluble in HCl	.7	.7	.8	.9	.9
Total ash	4.9	5.0	4.3	3.5	3.3
Alkalinity of soluble ash, as K_2O	.5	.5	.4	.3	.3
Ethereal extract	5.5	1.8	3.8	5.3	5.4
Alcoholic extract after ethereal	4.6	2.3	2.3	2.6	3.2
Aqueous extract after alcoholic	5.8	6.4	4.9	3.2	2.4
Cold water extract	11.8	10.5	6.8	5.9	4.7
25 per cent. proof spirit extract	10.2	9.2	6.1	5.5	4.8
Methylated spirit extract	6.5	2.9	4.5	5.8	5.6
Ginger dissolved (extract)	—	4.0	4.0	5.1	5.5
Ash dissolved	—	.1	.6	1.8	1.3
Water in air-dry ginger	12.3	13.4	14.0	13.4	13.5

All the results, except last line in this table, are on 100 parts, composed of 87.7 dry ginger and 12.3 parts of water. It will be observed that water dissolved the largest amount of solid matter and ash, and that rectified spirit reduces the ethereal extract even more than the alcoholic, but removes very little of the mineral matter. The author concludes that the simplest way of testing if ginger is exhausted is to determine the cold water and methylated spirit extract. These extracts are obtained by rubbing up one gram of ginger with 50 Cc. of the solvent, macerating for 48 hours in a corked flask, with occasional shaking, filtering, washing the residue slightly, and evaporating the extract to constant weight.

In a note the author points out that the object of his paper was ***not*** the detection of exhausted ginger, but an attempt to explain certain anomalies

found in the analysis of it. He is of the opinion that the detection of *small* amounts of spent ginger is very difficult, or impossible; but that *gross* adulterations may be detected by the simple methods given.—Yearbook of Pharm., 1896, 359–361.

ORCHIDACEÆ.

Orchids—Preparation for Herbaria.—Carl Josef Meyer communicates the following method for pressing orchids: Place the fresh plants in a large glass jar and ignite common sulphur in a porcelain dish; then close the opening of the jar with a glass plate. In the closed space sulphurous acid continues to develop until all the oxygen is consumed, and then the sulphur ceases to burn. In this way oxygen and water are withdrawn from the plant. In thus treating red and blue blossoms they are bleached and exhibit a white color. The plants thus treated are now taken from the glass jar and pressed in an airy place. If there is plenty of ventilation the plants during pressing again absorb oxygen, and the blossoms again develop the original color. Blackening of the leaves, however, is never altogether avoided.—West. Drug., June, 1897, 267; from Bull. of Pharm.

Vanilla—Improvement in the Quality of the Bourbon or Mauritius Variety.—Messrs. Lehn and Fink, in reply to an inquiry of Mr. Emile Ott, state that while Mexican vanilla beans were formerly regarded in this country as superior to the Bourbon or Mauritius bean, in recent years, expert knowledge having been brought to bear upon the cultivation of the Mauritius bean, the French government has exercised a strict control over the plantation, and greatly improved results have been obtained. The Mauritius bean to-day is generally regarded as a far finer product than in former years; in fact, only a few specially selected grades of the Mexican bean still outclass the Mauritius brand. The consumption of the latter, particularly in European countries, has enormously increased, steadily driving the average Mexican bean out of the market. Users of vanilla beans are sometimes disconcerted by failure of supposedly choice beans to give satisfactory results. The reason for such failure was not discovered until recent times, when it became definitely known that a vanilla mite, belonging to the class *Arachnoidea*, genus *Tyroglyphus*, is the cause of the deterioration. While this mite occurs in vanilla beans from nearly all sources, it occurs most frequently in Mexican beans. If infected, the bean is covered in spots with brown powder, among which little brown specks can be seen moving about by the sharp naked eye or through an ordinary hand magnifier; a bundle of infected beans will have a characteristic offensive odor at the small end.—Proc. Penna. Phar. Assoc., 1896, 128, 129.

Vanilla—Practical Method of Drying.—According to Dolabaratz, vanilla may be advantageously dried by enclosing the pods in hermetically sealed vessels with calcium chloride, about equal weights of pods and desic-

cating salt being employed. The chloride is not lost, for by simply reheating it can be used again. By this method, 2.981 kilos. of raw vanilla will produce 1 kilo. of the prepared article. The vanilla so prepared loses much less of its vanillin than when dried by the ordinary process in which it is exposed in the open air for several weeks.—Pharm. Journ., Nov. 7, 1896, 406; from "Independ. Creole," through Journ. Soc. Chem. Ind., xv., 613.

ARISTOLOCHIACEÆ.

Serpentaria—Admixture of Hydrastis in Commercial Samples.—Prof. E. L. Patch states that samples of powdered serpentaria and of fluid extract of serpentaria showing the presence of alkaloid, were analyzed by him and found to contain a mixture of hydrastine and berberine. Further investigation demonstrated that hydrastis root is found mixed with serpentaria, often to the extent of 10 per cent.—Merck's Rep., Aug. 15, 1896, 403.

LAURACEÆ.

Laurus Nobilis—Cultivation and Uses in Cyprus.—P. Grennadius, Director of Agriculture in the island of Cyprus, gives some information concerning the cultivation and uses of the laurel of Apollo, *laurus nobilis.* Its wood, leaves and fruit are available for various purposes. The wood serves for structural purposes, cabinet-making and fuel. The fruit, resembling small olives, yields a greenish oil, thick as butter and exhaling a strong, pleasant odor, which is well known as "laurel oil" in pharmacy and perfumery. The leaves serve as seasoning for cooked or preserved meats and fish, and are largely exported for this purpose. They are also used for packing with choice kinds of raisins and figs, in order to impart to those fruits the fragrance of the laurel oil, as well as to protect them against injurious insects. The laurel shrub is propagated only through its seeds, which are sown as fresh as possible direct in the soil and not in pots or boxes, as is the case with the seeds of some other plants. It prospers in a rather temperate soil, such as that of the southern range of the mountains of Cyprus, and, when soil and climate are suitable, will begin to bear fruit four or five years after the seed has been sown.—Journ. Imp. Inst., 3, 155.

Camphor—Production in Florida.—A correspondent of "Merck's Report" (June 15, 1897), writes that, to judge from indications, Florida bids fair to become a most important center for the production of camphor in the near future. Supplies of camphor have heretofore come from China, Japan and Formosa, but of the vast camphor forests that once existed in these countries but a small portion remains, as the direct result of the wanton waste in the process practiced there for obtaining the camphor from the tree. Camphor is usually obtained by boiling the chips of the wood and roots and bark in great kettles with water, and condensing the vola-

tilized camphor on rushes suspended over the kettle. In this process the entire tree is cut down, and even the roots dug up, but in Florida it was found that the camphor could be commercially produced from the leaves and twigs, 77 pounds of which yield 1 pound of camphor. Hence the bearing tree need not be disturbed nor injured in any way, as the foliage it bears is very dense, and may be thinned down one-half without scarcely being noticed. The tree, besides, bears a great amount of pruning without injury. It is an evergreen, and makes three growths a year—in April, June and October. According to H. G. Hubbard, special agent of the United States Department of Agriculture, the tree removes nothing from the soil, the camphor being formed entirely from the gases of the atmosphere, and hence the leaves, when deprived of their camphor and returned to the soil, constantly enrich the soil, which, in time, requires no fertilization whatever. Aside from its commercial uses, the camphor tree is one of the most ornamental ever cultivated, its beautiful shape being equaled by the arbor vitæ only. Its lower branches lie on the ground, while the top forms a perfect cone. The leaves are of a beautiful, pale, glossy-green color, and the flowers are small, but exceedingly pretty.

Camphor—Production in China.—Augustine Henry communicates a paper, in which he briefly reviews the history of the production, use, and export of camphor in China. Until a few years ago, however, there was no camphor produced on the mainland. It began at Chekiang, but its production there has practically ceased, while in the province of Kuangsi, where its production was commenced a short time ago, it promises to develop into an industry of importance. It is also produced in Fukien, where large forests of the camphor tree abound, but the product from these is so far trifling.—Pharm. Journ., March 6, 1897, 201.

Cinnamon—Adulteration of the Powder with Cane Sugar.—Dr. Rudolf Hefelmann has observed that cane sugar is frequently used to adulterate powdered cinnamon, and believes that it is added in order to mask a considerable addition of sand.—Pharm. Centralh., 1896, 699.

MYRISTICACEÆ.

Myristica Kinos—A New Variety.—Edward Schaer reports the results of an examination of a new kino, supplied by the director of the Royal Gardens and Museums at Kew, and submitted to him by Professor Warburg, of Berlin. The sample in question, labeled "Kât-jadikai" (=cutch-like product of jadikai or myristica) is known to be produced by incisions in the bark of

Myristica malabarica, Lam., in South India, showed in its exterior appearance more direct analogy to the well-known Malabar kino than to the "kâts" of acacia (cutch), or of "nauclea" (gambier), occurring in smaller or larger angular pieces, of a deep garnet color in thin fragments, like official kino. He compared this sample in its characters and reactions

with those of Malabar kino (from pterocarpus marsupium) and extended his investigations also to four other samples of *myristica* kino obtained through the courtesy of Dr. M. Treub and Dr. P. van Romburg, of the government's botanical garden of Buitenzorg, Java; the latter consisting of the still liquid juice of the bark of *myristica glabra*, "kapœas" from *myristica ep?*, and of *myristica succedanea*, as well as of a few grams of dried kino-like substance drawn from *myristica fragrans*. The author describes the character of his examination in some detail, and sums up the result as follows:

I. The dried juices of the bark of several Asiatic species of *Myristica*, for instance, of *M. malabarica*, Lam., and *M. fragrans*, Houtt, as regards their appearance and physical qualities, show but little difference from the official Malabar kino.

II. These substances, which may be termed "*Myristica* kinos," agree, in the chemical reactions due to their constituents, in all important points, with the kino of *Pterocarpus marsupium*. It can therefore be stated that drugs of a very similar character, and partly of close resemblance to official kino, are to be found in the families of Leguminosæ (*Butea*, *Pterocarpus*, *Milletia*), Saxifragaceæ (*Ceratopetalum*), Myrtaceæ (*Eucalyptus*, *Angophora*), and Myristicaceæ.

III. The *Myristica* kino differs, as far as can be observed, from the *Pterocarpus* kino, and probably also from *Butea* and *Eucalyptus* kino, by containing, in the crude state of the inspissated fresh juice, smaller or larger amounts of a distinctly crystalline calcium salt, viz., calcium tartrate, suspended in, and depositing from, the liquid juice. By this characteristic admixture it can be easily distinguished from the official kino and probably also from other kinos of commerce.

Whether this new substance might ever be obtained in combination with the production of nutmegs and mace, so as to play the part of a commercial drug, will depend, above all, upon a still better knowledge of its qualities, its formation in the living plant, its quantitative relations, and similar questions.—Pharm. Journ., Aug. 8, 1896, 117–118.

Mace—Histology.—A. Schneider has made a comparative study of true or Banda mace, from *myristica fragrans*, and of wild or Bombay mace, from *M. malabarica*. He finds that their anatomical characters are essentially different, the most marked differences occurring in the epidermal tissues and in the amylo-dextrin grains. The epidermal cells of true mace are described as being much elongated in the direction of the long axis of the arillus and tangentially flattened; those of Bombay mace, on the other hand, are radially flattened. The amylo-dextrin grains of true mace vary greatly in size and form, some ($5\mu \times 14\mu$) being nearly rectangular and much elongated, whilst others ($6\mu \times 9\mu$) are irregularly oval, and some are very small (2μ to 6μ in diameter). Others, again, are much thickened at one end (flask-shaped), and in most of the grains crystalloid bodies

may be detected. The amylo-dextrin grains of Bombay mace are usually more or less spheroidal, some being quite irregular, and very frequently they occur in groups. They vary from 2μ to 10μ in diameter, and their crystalloid contents seem much smaller than those in true mace. In addition the contents of the oil-cells of the two kinds of mace differ chemically, those of the Bombay variety being distinguished by a coloring substance which does not occur in appreciable quantities in true mace, if at all. On the addition of potash solution the cell contents are dissolved and an orange-red color gradually develops in the presence of this substance, the reaction requiring from one to three minutes to reach its maximum intensity. If sulphuric acid (25 to 50 per cent.) be now added, the color changes to yellow, and there is a partial precipitation of the coloring substance. This reaction is said to be a certain proof of the presence of Bombay mace, as true mace when treated with alkalies gives only a "light" orange-red coloration, which is changed by acids to a "faint" yellow. It is claimed that the presence of an almost infinitesimal quantity of wild mace can thus be detected, and that by the aid of the microscope, mixtures of the two kinds in the state of powder can be recognized as such.—Pharm. Journ., April 3, 1897, 288; from Journal of Pharmacology, iv., 57.

Ochoco Nuts—Botanical Source.—O. Warburg has recently had an opportunity of examining an oil seed from the Cameroons similar to that from the Gaboon, known as "ochoco" and identified some years ago by J. Moeller as being derived from a species of *dryobalanops*. The Cameroon seed, which was contained in the pericarp, has, however, been identified by Warburg as being the seed of a new myristicaceous plant belonging to the genus *scyphocephalium*, which he has named *scyphocephalium chrysothrix*, and he has reason to think that the ochoco of the Gaboon is yielded by the nearly allied species, *S. kombo*, Warb., which differs in the leaf, having a cordate base. Ochoco seed is stated to contain 61 per cent. of fat melting at 70° C.—Pharm. Journ., Oct. 31, 1896, 380; from Cat. des Colonies Franc.

CHENOPODIACEÆ.

Phytolacca Decandra—Analysis of Ash and of Gases of Combustion of the Root.—G. B. Frankforter communicates an interesting paper in which he points out some exceptional characters of the ash constituents of poke root. The samples subjected to examination were personally gathered and dried, and yielded an average amount of ash of 13.38 per cent., the ash being composed of: potassium oxide, 41.62; sodium oxide, 4.41; calcium oxide, 4.13; aluminum oxide, 1.62; iron oxide, 0.59; magnesium oxide, 6.25; carbon dioxide, 30.01; chlorine, 2.25; phosphorus pentoxide, 3.54, and silicon dioxide, 5.21 per cent. The exceptionally high percentage of potassium in this root was at first suspected to be due to locality, but samples from different localities yielded practically the same results. An an-

alysis of the gases given off by a destructive distillation of the root was also made in twelve samples, the results, as given in a table, showing wide variations in the composition of the gas given off at different stages of the distillation. Thus the gas given off early in the process contained as high as 60 per cent. of gas soluble in water, while that near the end of the process contained less than 2 per cent. The most interesting observation is that a final portion from 200 Cc. of gas, estimated as nitrogen, remaining unchanged after several days sparking, gave the spectrum for *argon*.—Amer. Jour. Pharm., March, 1897, 134–137.

Phytolacca Decandra—Proximate Constituents of the Root.—Geo. B. Frankforter and Francis Ramaley give a concise historical review of the investigations that have hitherto been made upon the root of *Phytolacca decandra* and report the results of their investigations on the same subject, carried out more or less continuously since October, 1895. The material, procured from wholesale houses, was carefully garbled by them personally, so as to insure its identity and quality. Most of the substances previously reported by others were found in the present investigation. Preston's *phytolaccine* was, however, not obtained, nor could the presence of tannin or chlorides be shown. They obtained some sugar which crystallized with great difficulty in clear, colorless, transparent orthorhombic prisms, their common forms being shown in cuts accompanying their paper. They believe this sugar to be undoubtedly the *glucoside* of Coscera and the *few crystals* observed by Partee: the *acicular crystals* of the latter being probably potassium nitrate, of which the root contains a considerable percentage. The constituents determined by their analysis and their percentages, are as follows: Fixed oil and wax, 0.627; resin, 1.010; non-reducing sugar, calculated as sucrose, 9.457; reducing sugar, calculated as glucose, 0.435; proteids, determined in alkali extract by Kjeldahl's method, 1.944; amido-compounds, calculated as "asparagin," 1.634; free acid, calculated as formic, 0.360; combined acid, calculated as potassium formate, 1.891; starch, 11.677; calcium oxalate, 6.225; nitrates, calculated as potassium nitrate, 2.408; cellulose, 16.378; lignin, &c., 3.206; gum, coloring matter, ash, moisture and undetermined, 42.748 per cent. The oil is of a brownish color and readily saponifiable with cold, fixed alkali; the wax is light yellow; the resin dark brown and very bitter. Free formic acid was readily obtained by simple distillation with steam, and in abundance when the root was distilled with sulphuric acid.

The authors, furthermore, obtained a small quantity of a whitish powder, forming frothy solution, and probably saponin as suggested by Trimble, but requiring further examination. Indications of the presence of alkaloid were obtained by the usual alkaloidal reagents, but not with picric acid or phosphomolybdic acid. Finally, after extracting the root with 90 per cent. and with 60 per cent. alcohol, an extract was obtained with cold water, amounting to 6.6 per cent. when dry, and having strong cathartic action.

The extracts obtained with 90 and 60 per cent. alcohol also had cathartic action, but in an inferior degree.—Amer. Jour. Pharm., June, 1897, 281–290.

PLANTAGINACEÆ.

Plantago Ispaghul, Roxb.—Description and Use of the Seeds.—Prof. Hartwich has had opportunity to examine the seeds of *Plantago ispaghul*, Roxb., part of a recent exhibit of East Indian drugs. The mucilaginous seeds are used internally, also when roasted, as a remedy for diarrhœa; externally as poultice in rheumatism. They are 3 Mm. long, 1 to 1½ Mm. wide, pointed, oval, arched on the back, on the front side curved in from the two long sides; in the middle of the furrow so formed is found the small chalaza. The color is a dull, grayish-brown; on the back is an oblong-oval, bright, reddish-brown spot. The epidermis of seed coat on the back side is modified to mucilage cells, whose content, as is the case with other species, appears stratified on swelling. The seed coat encloses the endosperm in which the small embryo lies. The valuable constituent of the species is the mucilage, which is apparently present in especially large quantities, for it could otherwise scarcely claim superiority to other species of *Plantago*. The plant is a native of India and Persia, its specific name, *ispaghul*, being Indian.—Pharm. Rev., Nov., 1896, 257.

SCROPHULARIACEÆ.

Digitalis—Care in Selection and Preservation.—Dr. Strahler states that the difference in the activity of various infusions of digitalis leaves is due to the carelessness of wholesale druggists in supplying a drug of uncertain age, the drug frequently improperly containing the stalks and frequently even not being obtained from the blossoming plants growing wild. The greatest care, too, must be exercised in the drying, preservation and shipping of the leaves, to avoid, as far as possible, exposure to light, air and moisture. Usually the drug is kept in sacks and wooden chests, but tin boxes should be used instead; and pharmacists would do well to procure their supplies from firms that are known to take the proper care in the preservation, not of digitalis leaves alone, but of all other sensitive herbs. Merck's Rep., June 15, 1897, 375; from Pharm. Post., 1897, 50.

Leptandra - Structure.—A. P. Breithaupt contributes a paper on the structure of the official leptandra (rhizome and roots of *Veronica virginica*, L.), accompanied by cuts showing the rhizome and roots natural size—in cross-section magnified, etc. The description is evidently careful and complete, but the paper does not admit of condensation, and must therefore be referred to in the original, in Am. Journ. Pharm., May, 1897, 235–240.

SOLANACEÆ.

Solanum Carolinense—Microscopical Characters.—The Amer. Jour.

Pharm. (Febr., 1897, 76–89) publishes abstracts from two theses presented by students of the Philadelphia College of Pharmacy, in which the microscopical characters of *Solanum carolinense* are very fully considered. In the first of these abstracts, from the thesis of Charlton G. Johnson, a flowering branch of the plant, a portion of a branch bearing fruit and of the fresh root, are shown in illustration and described, as are also transverse and longitudinal-radial sections of the root, transverse sections of the underground stem and of a younger portion of the petiole. The starch grains found in the root, which are also shown in illustration, bear a very close resemblance to those of the potato.

The second thesis, by M. Clayton Thrush, gives a description and shows in illustration the underground portion of the plant, a transverse section of one of the rootlets, a longitudinal section of the young root, a transverse section of the midrib of a leaf, and a portion of the transverse section of a fruit. This author found the fruit to contain the largest amount of alkaloidal constituents, the leaves coming next in strength, then the root, and finally the stem. The particular interest in these papers centers in the excellent microscopic descriptions, which have heretofore received very little attention.

Belladonna Root—Comparison of Alkaloid Contained in Separate Siftings of Powder.—In separating powdered roots into portions of more or less definite degrees of fineness by means of sieves, it probably, but rarely, happens that the separated portions are of equal potency. The active principle may, however, be so distributed that more easily pulverizable portions, as, for instance, the cortical portion of ipecacuanha or senega, will be represented in the finer powder, leaving the tougher fibrous portion represented in the coarser powders relatively stronger. In order to decide this question so far as belladonna root is concerned, R. H. Parker subjected a sample of the drug to light grinding, and separated it by means of No. 60, 40 and 20 sieves into "fine," "medium" and "coarse" powder, the "fine" powder constituting 38 per cent., the "medium," 22 per cent., and the "coarse," 40 per cent. of the original quantity ground. By described methods he obtained the results shown in the following table:

	Fine Powder.	Medium Powder.	Coarse Powder.
Moisture, per cent	7.8	7.7	7.9
Alcoholic extractive, per cent	6.04	7.23	7.55
Alkaloid by weight, per cent	0.1976	0.2600	0.2616
Alkaloid by titration, per cent	0.1984	0.2592	0.2632
Specific gravity of 1 in 4 tincture	0.8273	0.8282	0.8286
Color of tincture	dark	pale.	paler.

These results show that however desirable it is that the drug should be in a definite degree of fineness, it is obviously important that the powder, of whatever degree of fineness, should represent the whole of the drug, unless the final product is to be standardized.—Year-book of Pharm., 1896, 307–308.

Datura Alba—Hyoscine the Active Constituent of the Flowers.—Frank Browne, Acting Government Analyst, Hong Kong, has subjected the flowers of *Datura alba* to chemical examination, and reports the presence of hyoscine in them to the extent of 0.485 per cent. of the dried substance. The flowers as sold in the Chinese market are sun-dried, and in this condition contained during the dry season 11.29 per cent. of moisture, and gave 13.77 of ash after ignition. A fragrant smelling resin is also present in them in considerable quantity, and it is thought that this might afford a test for the detection of the flowers in cases of poisoning; for they are not alone popularly used by the Chinese as a medicine, being known by the terms

"*Mán t'o lo fa,*" "*Wan t'o lo hua,*" and "*Nau yeung fa,*" but also as a stupefying agent for kidnapping, robbery, and for cheating at games of chance. It is for such purposes administered with the food or tea, imparting to them neither distinguishable odor nor taste. The characteristic symptoms quickly manifest themselves: dimness of vision, unsteady gait, unintelligible chattering, dilation of the pupil, and rise in temperature. Recovery in mild cases takes place in twelve to twenty-four hours, but the power of memory, which is lessened, is not recovered for several days.—Pharm. Jour., Sept. 5, 1896, 197.

Datura Alba, L.—Alkaloidal Constituent of the Flowers.—J. B. Nagelvoort, referring particularly to Mr. Browne's paper, communicates the results of an alkaloidal determination in the flowers of *Datura alba*, L., grown in the United States. He found in flowers grown in parks in Chicago 0.464 per cent. of alkaloid by weight, a result which corresponds with that of Mr. Browne in a remarkable degree (0.485 per cent). The author gives the details of his process of assay. The close relationship of this plant with

Datura Stramonium leads the author to infer a corresponding richness of alkaloid in the flowers of the latter, which he would like to see official in the U. S. P. in place of stramonium seed. He recommends also that stramonium leaves should be collected with the blossoms.—Amer. Journ. Phar., Mar., 1897, 142–145.

Datura Alba, Nees—Alkaloid Determination in Seeds, Root and Leaves.—Among the exhibits of Indian drugs at Dresden were the leaves, root and seeds of *Datura alba*, Nees, which are described as follows by Prof. Hartwich: With the much broken leaves are mixed a few unripe, roundish, spiny fruits and leaves 16 Cm. long. The leaves contain calcium oxalate in glands, in the roots it is present as "krystallsand," which is likewise the

case with our *Datura Stramonium.* The seeds are larger than in our native species, yellowish-brown, flat, auriculate in form. The cross section usually shows, running near the edge, a pair of pronounced projections in which, as at the edge, the cells of the epidermis of the seed-covering are bulged outward. The seeds and leaves especially are used as medicine; their properties are narcotic, sedative and even hypnotic. They are said to be used in India to make people unconscious for criminal purposes. Since information concerning the constituents of the plant are completely lacking, it seemed advisable to carry out at least a preliminary investigation with the material at hand. Dr. Peinemann determined the alkaloid-content according to Keller's method as follows: Seeds, 0.541 per cent.; root, 0.315 per cent.; leaves, 0.41 per cent. All are calculated with reference to atropine. By comparison with the extraordinarily varying data found in the literature concerning *Datura Stramonium,* it appears that *Datura alba* is richer in alkaloids than our native species. The alkaloid was obtained as a colorless varnish. Treated in the known manner with fuming nitric acid and alcoholic potassium hydroxide, it gave the violet color of atropine, likewise, according to Flückiger, with sodium nitrate and potassium hydroxide; with concentrated sulphuric acid, the characteristic odor was detected, so that the identity of the alkaloid obtained with the so-called solanaceous alkaloids is not to be doubted. On the other hand, sulphuric acid in the cold gave a color reaction which atropine, etc., do not show, in that the alkaloid at the first moment dissolved with a red color which soon passed over into orange and yellow. Perhaps the coloration belongs to the indifferent stramonine discovered by Trommsdorf.—Pharm. Rev., Oct., 1896, 233; from Gehe's Bericht, Sept., 1896.

OLEACEÆ.

Olives—Cultivation in California.—Emery J. Eastman says the olive is rapidly coming to the front as one of the principal products of southern California, both for the pickled fruit and for the oil. Those who only know of olives from the green, flavorless fruit imported from Europe, can form no conception of the delicious flavor of the ripe berry, such as is used in California. As regards the oil, it is well known that most of that coming from abroad is adulterated or substituted by some foreign oil, mostly cotton-seed oil. The California producers have determined that the home oil shall be put upon the market pure and unadulterated, and to that end have procured an act to prohibit the manufacture and sale of impure olive oil in the state of California. Concerning the cultivation of the trees, the collection of the fruit, and the preparation of the oil, the following may find place here:

The trees are planted in rows about 20 feet apart, and begin to bear about the fourth year. A tree four years old will average about two gallons of berries, while one eight years old will often bear forty gallons.

When the fruit has become dark red it is considered ripe enough for the press. The berries that have fallen to the ground are first picked, then sheets are spread on the ground, and the tree is shaken and the branches struck with long poles to cause the rest to fall. For small quantities, an ordinary cider-mill is used for crushing the berries and expressing the oil. The largest olive mill in the country is in Pomona. The power for the machinery is supplied from a six-horse-power engine. The grinders consist of two great rollers of 900 pounds each, revolving in a hollow pan-like iron receptacle six feet in diameter and one foot deep. The olives are run into this receptacle to the depth of several inches. The rollers are started and the olives are ground into a pomace, like Hamburg steak. The pomace is then packed in "bruscoles," (small Italian basket-like containers for holding the pomace) and placed in a 100-ton hydraulic press. As the flow of water is regulated, the heavy press moves slowly down upon the bruscoles. The pressure must be very gradual and slow. The pressure is put on and then stopped, till the oil has been allowed to drip out, then a little more pressure is used, and this is repeated until all the oil has been pressed out. As it comes from the press it looks like black oil, or crude petroleum, but soon separates with the oil on top. It is then put into large tin tanks, and allowed to stand for several weeks to clarify. Then it is filtered through sand and charcoal, and lastly through white filter-paper. —Pharm. Era., Sep. 24, 1896, 395.

Olive Oil—Adulteration with Castor Oil.—According to Ferraro Annibale, olive oil is being largely adulterated with castor oil, and he therefore gives the following process for detecting its presence, which depends upon the fact that castor oil is soluble in strong alcohol, and dissolves fuchsin: Five volumes of the suspected oil are put in a test-tube, and 25 volumes of a reagent composed of 25 parts alcohol, and 1.2 parts of a 1 : 2000 fuchsin solution in strong alcohol carefully added. After the two fluids have separated, the point of contact is marked by a bit of paper pasted on the test-tube, and the contents are then shaken together for several minutes. Upon now allowing the mixture to rest for half an hour, the lower layer will be as much less in volume as castor oil was present, the upper alcoholic layer being that much the gainer in volume. After standing for some time, a reddish, homogeneous, transparent layer separates out and floats, this containing the castor oil. This method may also be made to serve for adulterations in castor oil by inverting the process. Castor oil behaves similarly toward acetic acid and fuchsine, being soluble in an equal volume in the former.—Merck's Rep., April 15, 1897, 245; from Pharm. Ztg., 1897, 124.

LABIATÆ.

Labiates—Microscopic Study.—Smith Ely Jelliffe, having often been called upon to determine from broken or powdered drugs in a mixture,

the ingredients of the same, had recently occasion to study the distinctive characters of the nutlets of various species of the *Labiatæ*, and now communicates his results, accompanied by a number of illustrations. He finds that in those labiates in which the herbs and flowering tops are official, such nutlets are liable to be found. These nutlets are all small, and so similar that at first sight it might appear that their differentiation was impossible, yet they can all be determined with a fair degree of accuracy save in a few cases. Two main groups may readily be made out: (1) Those in which the surface of the nutlets as seen in cross-section or in side-relief is smooth; and (2) those in which the margin of the pericarp is undulate or papillose. The key to the species studied is given by the author as follows:

Nutlets quite smooth:
- (*a*) Dark-brown, surface cells thin-walled. Lavender.
- (*b*) Light-brown, surface cells thick-walled. Marrubium.

Nutlets with undulate or papillose margins.
- (*a*) Minutely papillose.
  - 1. Nutlets small.
    - Surface cells polygonal, regular above, irregular beneath. Hedeoma.
    - Surface cells much contorted.
      - Papillæ acute. Origanum.
      - Papillæ flattened:
        - I. Ovate cylindrical small, 0.4 to 0.5 to 0.6 to 0.8 Mm. Menthas.
        - II. Oval, larger: Surface cells irregular. Melissa.
  - 2. Nutlets larger. Rosemarinus.
    - Nutlets less irregular. Marjoranum.
- (*b*) Markedly papillose.
  - Tuberculated and sometimes hairy. Scutellaria.
  - With smooth and flattened papillæ. Thymus.

—Drug. Circ., Febr., 1897, 34–35.

Salvia Officinalis—Therapeutic Value.—Dr. Krahn has studied the therapeutic effect of sage on thirty-eight patients affected with hyperhydrosis. Only two of these were not influenced by the remedy, while in all the other cases, of whom twenty-nine were phthisic patients, the profuse perspiration ceased or was diminished, and again set in upon non-administration. The tincture was employed in doses of about twenty drops three times a day. Pharm. Rev., Febr., 1897, 34; from Therap. d. Geg., *37*, 733.

CONVOLVULACEÆ.

Scammony—Remarkable Adulteration.—J. W. Thomsen has subjected a sample of scammony, marked to contain "84.864 per cent. of scammonin,

$C_{32}H_{56}O_{16}$," and said to be of German origin. It consisted of irregular broken pieces, apparently portions of a cake, about half an inch in thickness, greenish-black, hard and horny, breaking with a resinous fracture, and very difficult to powder. It contained: soluble in ether, *0.4* per cent.; soluble in alcohol, *2.0* per cent.; soluble in water (apparently gum arabic), *42.6* per cent.; starch and a little cellular tissue, *43* per cent.: moisture, *12* per cent. On incineration it yielded *2.12* per cent. of ash.—Pharm. Journ., March 20, 1897, 245.

Jalap—Effect of Phosphatic Manures on the Growth of the Tubers.—David Hooper observes that for many years past the jalap plant (Ipomœa purga) has been successfully cultivated in the Government cinchona plantation at Dodabetta, Nilgiris, and quantities of the dried tubers have been supplied annually to the Madras Medical Store Department. Until about two years ago, the plants seemed to flourish, and the tubers were of satisfactory quality, yielding from 16 to 18 per cent. of resin; but since then the plants have languished here and there in localities: the tubers were of smaller size, slightly discolored, and yielded smaller percentages of resin. Believing this deterioration to be due to exhaustion of the soil, some experiments were made with manuring. For this purpose some plants were raised from small tubers in boxes, under identical conditions except as to soil and manure, Into one box was placed some ordinary soil of poor quality; into the second, some of the same soil mixed with some mineral phosphate in the proportion of 10 cwt. an acre; and in the third box, the soil was mixed with super-phosphate in the same proportion. After nine months, the plant that grew from the tuber in the third box was much taller than that in the second, and the plant in the second was finer than that in the first; the subterranean portion of the plants corresponding with the aerial growth. The respective weights, percentages of water, of resin, and of ash, were as follows:

	Weight of fresh tuber.	Weight of dry tuber.	Percentage of water.	Percentage of resin.	Percentage of ash.
No. 1. Unmanured	32	7.62	76.2	10.49	4.95
No. 2. Phosphate	85	22.44	74.2	11.97	4.38
No. 3. Superphosphate	228	54.20	76.2	13.79	4.30

Considering that the tubers were taken up before they were fully grown, the author considers the results of the application of manures most satisfactory.—Pharm. Jour., July 11, 1896, 21–22.

BIGNONIACEÆ.

Gelsemium—Presence of Stems in the Commercial Drug.—L. E. Sayre communicates the results of microscopic examinations of the rhizomes,

roots and stems of *Gelsemium sempervirens*, which were undertaken mainly with the view to the determination of stems in the commercial drug, and particularly in the commercial powder. His attention had been drawn to the presence of stems in the drug by the difference observed by students to whom fragments of the commercial drug had been given for microscopic examination. The microscopic distinction between the root on the one hand and the rhizome and stem on the other are, as shown in illustrations accompanying the author's paper, quite marked; but the distinctions between the rhizome and stems are not so apparent. Hence, the detection of stems in the powdered drug by microscopic examination has not been attended with much success. The different parts are being subjected to chemical examination, mainly with the view to determine in what degree the presence of stems affects the medicinal value of the drug.—Amer. Jour. Pharm., Jan., 1897, 8–13.

Gelsemium—Analysis of Root, Rhizome and Stem.—Referring to his above paper, L. E. Sayre communicates the results of analyses, made by M. V. Ingham, of the root, rhizome and stem of Gelsemium sempervirens, the stems being obtained from a living plant of six years growth, cultivated in a nursery. Since writing his previous paper, Mr. Sayre has obtained gelsemium root from different quarters, and has become convinced that there is no difficulty to obtain the drug free from stems from houses having an established reputation as dealers in crude drugs. The results of Mr. Ingham's analyses are given in a table, as follows:

Constituents.	Rhizome.	Root.	Stem.
Moisture	3.2	3.	3.8
Volatile oil	0.5	0.4	Trace.
Fixed oil	5.6	7.4	3.2
Resins	4.4	2.4	3.8
Gums	0.8	0.7	1.1
Gelsemine alkaloid	0.2	0.17	—
Gelseminic acid	0.37	0.3	—
Starch	6.8	7.6	6.3
Ash	2.6	2.2	2.7
Other organic acids	2.7	2.8	1.9
Inert material, cellulose, etc	72.83	73.03	77.2
Total	100.	100.	100.

The method pursued was that of Dragendorff, except in the case of gelsemine and gelsemic acid, which were separated by a modified process. The alkaloid was obtained only in the amorphous state; the acid in transparent needle-shaped crystals.—Amer. Journ. Pharm., May, 1897, 234, 235.

APOCYNACEÆ.

Strychnos Nux Vomica—Botanical Description and History.—Prof. John Uri Lloyd contributes a paper, accompanied by an illustration showing a flowering branch, fruit, and different organs of the flowers and fruit of *Strychnos nux vomica.* He also gives a brief botanical description of the plant, together with a historical description of the drug derived from it, its synonyms, and its pharmacopœial record, appending also a bibliography embracing 41 different references to his subject.—West. Drug., March, 1897, 109–110.

Nux Vomica—Distinction of the Powder from that of St. Ignatia.—Sauvan has investigated the various points whereby the powders of these substances may be distinguished the one from the other. He finds that nux vomica powder, in the first place, contains numerous hairs and fragments of hair which are cylindrical and mostly short and isolated. In the sclerenchymatous cover of the seeds occur either alone or arranged in groups curved cells, with very thick, porous, yellow walls. The remains of the inner albumin appear as a rule as polygonal cells, the walls of which are very thin in the middle of the seed. The intermediate layers of cells possess thicker walls, in the outer layers the cells are clear and filled with granular matter. The inner layers of albumin are composed of small yellow cells. In the powder of St. Ignatius bean, the albumin is found to be very similar to that of nux vomica. The outer layers are composed of prismatic cells with wavy brown walls. The hairs occur seldom and usually in groups. In place of the sclerenchyma one finds cells closely pressed together. On treatment with boiling alkali the powder yields, on cooling, characteristic voluminous crystals. The chief points of difference are—the hairs in nux vomica are short, numerous, cylindrical, and occur singly, those of Ignatius bean are longer, less frequent, in clusters. The base of the hairs of nux vomica thick and broad, of Ignatius branched; the seed husk of nux vomica is schlerenchymatous, with cells arranged in groups or singly, having thick yellow perforated walls, that of Ignatius a dense network, with thin walled cells; the albumin, inner layers, nux vomica almost cubical cells, Ignatius long cells; middle layers, nux vomica, polygonal, thick walled, Ignatius polygonal, but thin walled; inner layer nux vomica small brown cells, Ignatius small brown wavy cells. Ignatius powder, warmed with alkalies, and the solution cooled, yields very characteristic crystals, nux vomica does not.—Drug. Circ., June, 1897, 162; from Bull. de Pharm. de Sud-Est.

Nux Vomica and Ignatia Amara—Identification of Acid and Assay of Alkaloidal Constituents.—In an inaugural dissertation submitted to the University of Strassburg, G. Sander gives the results of his experiments and studies by which he endeavored to determine the following points connected with drugs derived from *strychnos* species: 1. The identity of the

acid, heretofore designated as "igasuric acid;" 2. The determination of a method of assay that shall yield the two principal alkaloidal constituents of these drugs, strychnine and brucine, in a pure condition and without loss; and 3. The determination of an accurate method for determining the proportion in which these two alkaloids are contained in the mixed alkaloids obtained.

Concerning the first point, the identity of the acid, the author observes that while long regarded as an acid characteristic of strychnos drugs, it was subsequently believed to be malic acid, but finally recognized to be a tannic acid. The results of the author's experiments now prove conclusively that the acid, heretofore known as igasuric acid is *caffeo-tannic acid* (dioxycinnamic acid), but it remains to be determined whether the strychnos alkaloids exist solely combined to this acid.

Concerning the second question, the author has critically experimented with all the methods that have heretofore been recommended for the assay of strychnos alkaloids, and finds several of them to yield fairly good results.

But the only method that will yield conveniently and expeditiously a pure, white crystalline mixture of the alkaloids, is that proposed by C. C. Keller (see Proceedings 1895, 1024). Having been engaged in the determination of strychnos alkaloids during the time when Keller's method was developed, he had reached a very similar method which he now recommends for the assay of these bases.

As to the third question, the methods heretofore in use for the estimation of the relative proportions of strychnine and brucine are of two kinds: the one depending upon the absolute separation of the two alkaloids; the other upon the destruction of one of them by oxidation, etc. The latter method is advocated by the author, the method proposed by him depending on the destruction of the brucine by means of potassium permanganate. Operating by this method, he found that the percentage of strychnine in the total alkaloids from nux vomica and its preparation ranged from 43.9 to 45.6 per cent., and in that from Ignatia beans from 60.7 to 62.8 per cent. In the case of nux vomica, the higher figure corresponds very closely with the percentage required by a mixture of the two alkaloids in molecular proportions, viz., 45.9; whilst the higher figure, in the case of Ignatia, is close to 62.9, the percentage of strychnine required in a mixture of 1 mol. brucine and 2 mol. strychnine. This leads to the inference that the two alkaloids exist in these seeds in simple and uniform conditions, and renders it possible that they are the products of splitting up of a more complicated compound.—Arch. d. Pharm., 1897, Mar. 3, No. 2, 133–137.

Quebracho Colorado—Character of Yellow Coloring Matter.—Perkin and Gunnel have determined the yellow coloring matter of the wood of *Quebracho colorado* to be identical with

Fisetin, $C_{15}H_{10}O_6$, the coloring matter of young fustic (*Rhus cotinus*).

It occurs in glistening yellow needles, dyeing similarly to quercetin, and yields compounds with mineral acids. Its benzoyl and acetyl derivatives have also been prepared. Fused with alkalies it yields protocatechuic acid and probably resorcinol. Ellagic and gallic acids have also been obtained from the wood, these being probably formed during the isolation of the fisetin.—Amer. Journ. Pharm., Nov., 1896, 626; from Journ. Chem. Soc., 1896, 158.

Geissospermum Vellosi—Proximate Examination of the Fruit, Leaves and Bark.—Dr. Theodore Peckolt states that the bark of *Geissospermum vellosi*, known in Brazil under various local names, but most popularly under the name of "Pau Pereira," has long been valued as a remedy in swamp fevers. This led them to call the bark "Pereiorà" and "Pereiriba," meaning "valuable bark," which was corrupted by the Portugese to "Pau Pereira," meaning pear tree, doubtless owing to the resemblance of its fruits to the ordinary pear. Dr. Peckolt has subjected the fruits, leaves and bark of this handsome Brazilian tree to proximate examination. In the fruits he found, beside caoutchouc, resins, oil, and unimportant substances, a small percentage of a colorless crystalline resin and 0.035 per cent. of amorphous pereirine. In the leaves he found 1.110 per cent. of caoutchouc, 0.597 per cent. waxy substance, 1.862 per cent. soft resin, 1.622 per cent. neutral resin, 4.333 per cent. acid resin, and 1.933 per cent. of pereirine. The fresh leaves yield 11.872 of alcoholic extract, and 15.3 per cent. of aqueous extract. The bark, which is well known in Europe under the name of

Pereira Bark, and which has been determined by Brazilian and European chemists to contain the alkaloids pereirine, geissospermine and vellosine, yielded to the author's proximate examination the following constituents: Waxy substance, 0.38 per cent.; resin, 3.192 per cent.; acid resin, 1.06 per cent.; pereirine, 2.72 per cent.; geissospermine, 0.125 per cent. The most important constituent is evidently pereirine, which appears to pervade all parts of the plant, fruit, leaves and bark, the bark layer containing the alkaloid in the bark to the exclusion of the cork layer. The large percentage of this alkaloid in the leaves is also noteworthy, and these could doubtless be utilized for its preparation. Both the bark and the alkaloid are official in Brazil, but the pereirine as sold there, being made by the old method of E. C. des Santos, who first isolated it, is not a pure product. It is yellow, and not completely soluble in ether. When pure it is nearly colorless, amorphous, odorless, but strongly bitter; it is readily soluble in petroleum ether, benzol, ether, chloroform, amyl-alcohol, ethyl-alcohol and in acidulated water, but insoluble in water and in ammonia. It appears to be a remedy well adapted to the prevalent swamp fever of Brazil, and is given in daily doses of from 2 to 4 grams, which, however, are considered unnecessarily large.—Zeitsch. Oest. Apoth. Ver., Dec. 1 and 10, 1896, 889–891, and 913–917.

SAPOTACEÆ.

Chicle Gum—Mode of Production.—While in Southern Mexico, Edward N. Butt, having shipped from thirty to thirty-five tons of chicle gum, made some inquiries concerning its production, and he now communicates the results of his inquiry, together with the history of its use and the methods of preparing chewing gum. The latter is sufficiently familiar to American readers, and needs no further notice here. The gum is the product of

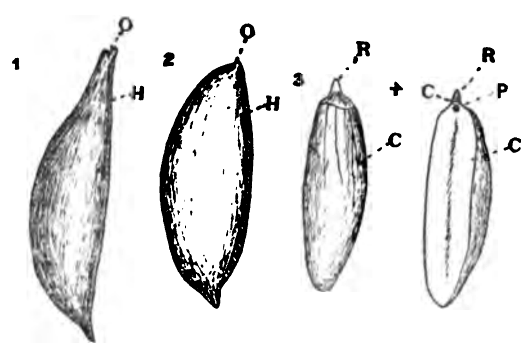
Achras sapota, a tree which abounds in the forests of Yucatan and of the adjacent States of Central America. The natives (Peons) having selected those trees which are sufficiently mature, make V-shaped incisions in the stem, from which the juice exudes and soon becomes indurated by exposure to the scorching heat of the sun, when it is collected. By making fresh incisions from time to time, the gum may be so collected during a period of two or three years, after which they are allowed to rest for four or five years, and are then again fit to undergo the tapping process and yield fresh supplies of gum. When a sufficient quantity of chicle gum has been thus collected, it is pressed into thick oblong blocks, weighing from twenty-five to thirty kilos, and in this form it is carried to the stores of the merchants, who, for export, usually pack three of these blocks in a bale, the average weight of such a bale being about 80 kilos.—Pharm. Journ., April 17, 1897, 328.

India Rubber—Collection in Mexico, Varieties, etc.—Sir Henry Dering, in a report on the productions of Mexico, says the rubber tree is indigenous to Mexico and is found growing wild along both coasts, below 22 degrees north latitude, from sea level to altitudes running from 1,200 to 1,500 feet, and principally by the river meadows. Rubber is essentially a tropical tree, hence it requires a hot and moist climate. The temperature best adapted for its vigorous growth is above 86° Fahrenheit, and the rainfall should be at least 60 to 70 inches per annum. There are eight kinds of rubber trees that grow wild in the country, but the kind known under the name of "Castilloa elastica" is the most important and the best, as it is very much sought for, for its sap and for propagation. Regarding the work of extracting the rubber, one man will tap from twenty to twenty-five trees a day if the operation is performed carefully and methodically. In most places the tapping is done in May and sometimes again in October, but it is not advisable to repeat the operation as often as that. The process generally consists in making two or three incisions in the lower part of the tree and collecting the sap that flows from them on clay vessels placed next to the trunk. The process can be repeated every year for twenty-five years or more, especially if the wound is covered with wax or clay after the flow of the sap has ceased. When there is a large quantity of milk gathered it is placed in a barrel having a faucet and a solution of five ounces of sodium chloride or carbonate in sufficient water to

cover the whole mass, which is agitated with a stick every now and then. After the lapse of twenty-four to thirty-six hours the water is allowed to run out through the faucet; this operation of washing is carried on until the rubber becomes white. About 44 per cent. of rubber remains from the original amount of milk after the water and other matters have been eliminated by evaporation. Trees planted on lands having the soil, climate, and elevation adapted for the culture, will produce from five to six pounds of juice on the first year that they are tapped, which amount is equivalent to 2.4 pounds of pure rubber.—Pharm. Journ., Sept. 5, 1896, 206; from Journ. Soc. Arts.

Bassia longifolia, L.—*Histology of the Seeds.*—Professor Rodney H. True, after calling attention to the botanical characters of *Bassia longifolia*, L., its distribution in the East Indies, and the variety of useful products obtained from it—including timber, gutta percha, and food—discusses particularly the seeds, which on account of their richness in fatty oil, are of considerable value. This fat is obtainable by expression, melts at 25.3° C., contains 79 per cent. of stearic acid, and is used by the natives of Ceylon and India for a variety of purposes—as food, in the manner of butter, for making soap, pomades, candles, etc. It is present in the seeds, according to E. Valeata, to the amount of 51.14 per cent., the analysis showing besides the following: Alcohol extract, 7.83; tannin, 2.12; starch, 0.07; mucilage, 1.65; soluble albumen, 3.60; insoluble proteid, 3.60; extract, 15.50; and ash, 2.71 per cent.—Professor True having been placed in possession of some of the seeds which were among the exhibits of Ceylon at the Columbian Exhibition, gives a detailed description of them and of

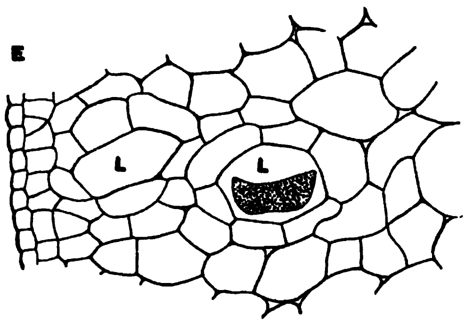
FIG. 47.



their microscopic structure. The seeds are from 3 to 4.5 Cm. long and about 1 Cm. wide, and have a smooth, shining, chestnut-colored shell. They are very narrowly elliptical, at each end prolonged into a more or less marked beak-like projection. The micropylar end is somewhat broader, and is marked by a slight notch near the lip of the beak. Owing to mutual pressure in the fruit, the seeds are usually more or less compressed

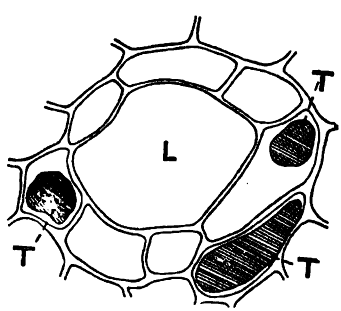
laterally, one side generally being flattish, the other convex. The hilum or region of attachment extends along the inside edge of the seed, as a long, pale scar with a roughish surface running nearly the entire length. The seeds of this description, which the author designates as the "narrower form," constitute the greater part of the specimen; but there are other seeds present of "broader form," reaching with the above-mentioned length a width of 1.5 Cm. In these the beaks are shorter, being merely short projections at the ends. In color this kind is lighter and less shining than in the narrower form. The distinction in shape is well shown in the accompanying cut (Fig. 47), the seed shown at *1* being a side view of the "narrower form;" that at *2* a view of the seed of "broader form;"

FIG. 48.



3, a side view of embryo removed from shell; *4*, embryo with one cotyledon removed—all of natural size. The micropylar opening is shown at *O*; the hilum at *H*; the radicle of embryo at *R*; the cotyledon of embryo at *C*; the point of attachment of cotyledon removed at *C'*, and the plumule

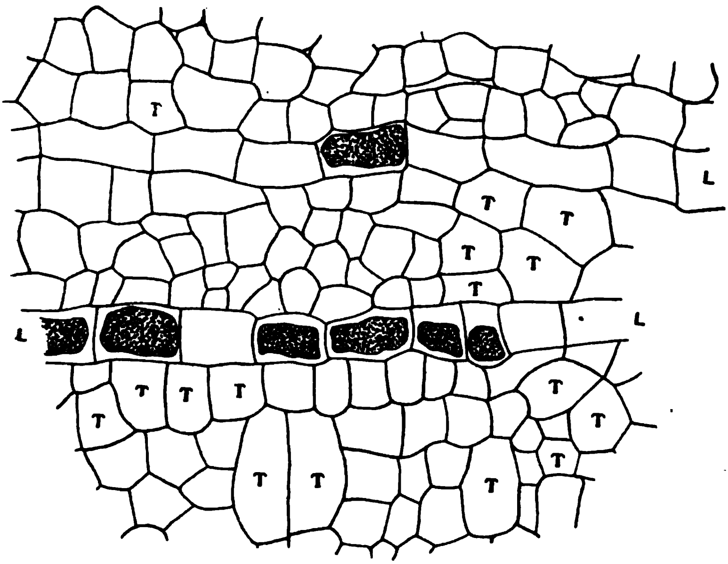
FIG. 49.



at *P*. Then follows, illustrated by the following figures (48, 49, 50), a description of the microscopic structure of the "narrower form" of the seed of *Bassia longifolia*: Fig. 48 showing a transverse section of the cotyledon, magnified 1890 diameters; *E*, showing the epidermis of the

cotyledon, and *L* the latex reservoirs. Fig. 49 shows a transverse section of a latex reservoir in detail, magnified 300 diameters ; *T*, the tannin containing cells and the masses in the same, and *L* the latex reservoir. Fig. 50 shows a portion of the longitudinal section of the cotyledon, magnified

FIG. 50.



180 diameters; at *L* latex containing cells in two series, while *T* shows the tannin-containing cells. For the detailed description reference must be had to Pharm. Rev., Jan., 1897, 5–7.

COMPOSITÆ.

Insect Powder—Commercial Quality and Examination.—Geo. Reynolds Durrant reviews the history, characters, chemical composition, and adulterations of insect powder, and gives the results of his own observations and investigations concerning it. He observes in reference to the Persian variety, prepared from the flowers of *Chrysanthemun Caucasicum*, that it has been replaced by the Dalmatian flowers, *Chrysanthemum cinerariæfolium*, not on account of any superiority of the latter, but because the Persian powder has been grossly adulterated. In his experience, both kinds are equally useful, if equally free from sophistication. At the present time, the insect powders of commerce may be divided into four classes: (1) The powders obtained from the closed flowers of *C. cinerariæfolium*, either wild or cultivated; (2) From half-open or mixed half-open and open flowers of the same species; (3) Powders ground from damaged flowers; and (4) Foreign ground powders, divided into grades of badness

under meaningless terms. The adulterants, such as quassia, aloes, senna, and coloring matters, such as fustic, turmeric and chrome yellow, and even the Hungarian daisy as adulterant, the author considers as things of the past. The difference in quality is due to the causes outlined in the four classes mentioned.

Insect powder to be of efficient quality must be prepared from the *closed* insect flowers. The toxic properties are due to: (*a*) a *volatile oil* amounting to 0.5 per cent. in picked specimens of closed flowers and much less in open flowers; and (*b*) a *soft acid resinous body*, which is the principal source of the toxic effect. It is found to the amount of 4.8 per cent. in selected closed flowers, less than 4 per cent. in half-open flowers, and still less in flowers that are fully open; the whole plant apart from the flowers containing only mere traces of this resin. While the *fine dry powder*, after exhaustion with ether, has no decided toxic properties, it is the author's opinion, based upon numerous experiments, that the exceedingly fine powder contributes something to the insecticidal properties by its physical action.

A very important observation made by the author is that chlorophyll, in its green, unchanged form, is not found in selected dried, closed insect flowers, while half open flowers and those that are fully developed invariably show a certain amount of chlorophyll coloring in the ether extract. Powders prepared from mixed and half open flowers, however, only show traces of chlorophyll (less than 0.5 per cent.) while in the foreign ground powder it often amounts to from 50 to 80 per cent. of the ether extract.

A perfect sample of insect powder should pass a sieve having at least eighty meshes to the linear inch. It should yield 5.25 per cent. of combined essential oil and soft resin, and in this chlorophyll should be absent or present only in the merest trace. The following simple method of examination should, in the author's opinion, be adopted by all who aim to sell genuine insect powder: Place 100 grains of the powder to be tested in the cylinder of a glass syringe (1 oz.). The powder should be pressed down compactly on to a piece of absorbent cotton, to act as a filter. Moisten with ether .735. Close the top of the syringe, and macerate for 30 minutes; percolation may then proceed; the powder being repercolated with the same fluid four times, and finally washed through with sufficient ether to make up one fluid ounce. The resulting percolate should be of a rich yellow color; if a pronounced green color be the result, the sample may be discarded at once. In the absence of much green coloring matter, the fluid may be carefully evaporated (temperature not exceeding 200° F.), and the residue weighed in a tared watch-glass. The resulting soft mass should not weigh less than 3.75 grains, and in the finest samples reaches 5.5 grains, and should have the pleasant and characteristic odor of the flowers.—Pharm. Journ., June 12, 1897, 505–507.

Parthenium Hysterophorus—Botanical Characteristics and Proximate

Constituents.—In a thesis submitted in 1889 (see Proceedings, 1890, 443), H. V. Arny had given the results of a chemical investigation of *Parthenium hysterophorus*, in which he had pointed out that the bitter principle of the plant was not an alkaloid, but was supposed by him to be a glucoside, while previous experimenters—Dr. Jose R. Tovar (1885), Guyet (1886), and Dr. Carlos Ulrici (1888)—had described it under the name of "parthenine" and "parthenicine" as being an alkaloid. Believing that the plant, which is one of the most common weeds of Louisiana, may have a future, the author has recently resumed his investigations, and reports the results together with an interesting botanical description of the plant and of its histological character; his paper being profusely illustrated with cuts showing a flowering branch of the plant, the various flower organs, enlarged microscopic sections of the leaves, etc. He found the fresh plant, gathered in each month from April to September, inclusive, to lose from 70 to 80 per cent. of its weight on drying in the air, and that the yield of the active constituent, for which he retains the name

Parthenin, from the air dried drug varies as follows according to the seasons of collection: April, 0.31 per cent.; May, 0.84 per cent.; June, 1.03 per cent.; July, 1.13 per cent.; August, 0.66 per cent.; September, 0.53 per cent. These results point out the months of June and July as being the most favorable periods for its collection in the locality from which the samples under examination were obtained. After trying various processes for the isolation of parthenin, the following was found most satisfactory: The infusion is treated with lead acetate, filtered, the filtrate shaken out with chloroform, the chloroformic solution subjected to distillation, and the residue is crystallized once or twice from alcohol containing a little water. In this way pure, well-formed crystals were obtained —some 5 Cm. long—melting at 168°–169° C., soluble in 160 parts of water at 20° C., 5 parts of alcohol of 95 per cent., 2½ parts of boiling alcohol, 110 parts of ether, and in chloroform and acetic ether. It is soluble in solution of soda and in ammonia water, the latter solution remaining colorless, while that in solution of soda turns red-brown. Its aqueous solution is neutral to litmus, and does not afford a precipitate with Mayer's reagent, thus showing its non-alkaloidal character. Further experiments also proved it to be non-glucosidal, its chemical relation being somewhat akin to santonin.

In view of the apparently well-established value of parthenin (described by Tovar as parthenine and by Ulrici as parthenicine) as a remedy in facial and cranial neuralgia, the author expresses the hope that therapeutists may give the subject further consideration and study.—Amer. Jour. Phar., April, 1897, 169–180.

Vernonia anthelmintica, (L), Willd.—Examination, etc., of the Fruit.—Prof. Hartwich has examined some fruits of *Vernonia anthelmintica*, received with other East India drugs from a recent exhibition in Dresden.

From the fruits of this plant, which occurs in all parts of India, an electuary is made with honey which constitutes a favorite remedy for intestinal worms. The fruits are black, longitudinally striate, with remains of the pappus at the upper end; they reach a length of 6 Mm. and a breadth of 1 to 1½ Mm. According to Dymock the seeds contain an alkaloid; but in the light of our present knowledge the occurrence of an alkaloid in the family of the *Compositæ* must be regarded as at least doubtful. An investigation of a considerable quantity of the drug gave no trace of alkaloid. A brownish-green, bitter-tasting fluid oil was found to the amount of 17.3 per cent., together with a small quantity of bitter-tasting, greenish-brown resin.—Pharm. Rev., Dec., 1896, 274.

Sage Brush—Chemical Analysis.—Griffith H. Maghee reports the results of an analysis of the leaves and flower heads of *Artemisia tridentata*, Nuttall (commonly known as "sage brush" or "sage bush," and abounding on the western plains) as follows:

Moisture	8.48	per cent.
Ash—composed of calcium, potassium, manganese and iron combined with hydrochloric, sulphuric, phosphoric and carbonic acids	4.92	"
Petroleum ether extract—containing volatile oil, 0.84; fixed oil and fat, 0.41; wax melting at 61° C., 0.61, and caoutchouc, 0.26	2.12	"
Ether extract—consisting of resins	4.25	"
Absolute alcohol extract—containing resins, glucosidal bitter principles, etc	3.32	"
Water extract—composed of mucilage, 3.22; glucose, 0.52; extractive, 4.90	8.63	"
Alkali extract—containing pectin, 2.74; extractive, 3.36	6.10	"
Acid extract	1.14	"
Lignin	6.44	"
Cellulose	54.60	"

The bitter principle was obtained in an amorphous condition. Neither tannin nor starch were found in the drug.—Amer. Journ. Pharm., March, 1897, 152, 153.

Canada Thistle—Proximate Analysis.—Herm J. Pierce has subjected the Canada thistle—*Cnicus arvensis*—(*Cirsium arvense?*—Rep.) to proximate examination, and found the plant to contain a volatile alkaloidal principle, which is very difficult to obtain in a crystalline condition, has a narcotic odor, and is soluble in ether, chloroform and alcohol. Besides this it contained an organic acid, chlorophyll, volatile oil, fat, wax, caoutchouc, mucilage, dextrin, glucose, pectin, and albuminous matter, but starch, tannin and glucosides were absent. The plants for this analysis were collected during flowering season in July and August; they were deprived of foreign matter and thoroughly dried without exposure to direct sunlight.—Amer. Journ. Pharm., Oct., 1896, 529–532.

RUBIACEÆ.

Cinchona—Cultivation in Bengal.—According to the Thirty-fourth Annual Report of the Cinchona Plantations of the Government of India in British Sikkim and Rutan, by Dr. George King, Superintendent, the number of trees uprooted for their bark during the year 1895–96, was 453,000, comprising 65,000 of *C. succirubra*, used for the manufacture of "Government Cinchona Febrifuge," and 388,000 of the kinds which yield yellow or quinine-producing bark, chiefly hybrid cinchona and *Calisaya Ledgeriana*, a large proportion of the trees uprooted being small. The number of plants was increased during the year by 9,200 hybrids; the total census of living cinchona plants at the close of the year, including nursery stock, was 3,807,701. The crop collected during the year amounted to 467,190 lbs. of dry bark, consisting of 53,380 lbs. of red and 413,810 lbs. of yellow bark. The whole of this crop, with the exception of 790¼ lbs. supplied to the Government Medical Stores Department or sold to Government institutions, was made over to the cinchona factory for manufacture into quinine and febrifuge. In addition to the bark cropped at the Government plantations, 170,000 lbs. of quinine-yielding bark was purchased from private cultivators in the district. Seventy-four thousand lbs. of red bark worked up in the factory during the year yielded 3,124 lbs. of cinchona febrifuge, valued at Rs. 10 (about 12*s.*) per lb., and from 387,200 lbs. of yellow bark, 9,004 lbs. of quinine sulphate, valued at Rs. 14 (about 16*s.*) per lb., were manufactured. An additional 1,500 lbs. of quinine was purchased from the quinine factory of the Madras Government at Ootacamund, in order to meet the greatly increased demand for the 5 grain packets, which are issued to the people at all post-offices throughout the province at the rate of one pice each (less than a farthing).—Pharm. Journ., Oct. 17, 1896, 345.

Cinchona—Histology of Various Barks.—Alfred R. L. Dohme has contributed an interesting paper, illustrated with numerous cuts, on the histological character of different cinchona barks, which he classifies into three divisions: 1, those barks that are histologically true cinchona barks and at the same time contain cinchona alkaloids; 2, those barks that are histologically not true cinchona barks but still contain cinchona alkaloids; and 3, those barks that simulate cinchona barks, but are not histologically cinchona barks and do not contain cinchona alkaloids. There are about twenty varieties of cinchona barks and it is a very difficult matter to distinguish them, since they have been and are now changed so much by grafting and crossing, The most generally used and best known varieties are: 1, *Cinchona succirubra*, Pavon; 2, *Cinchona Calisaya*, Weddell; 3, *Cinchona Ledgeriana*, Moens; 4, *Cinchona lancifolia*, Mutis; and 5, *Cinchona officinalis*, Hooker. Although the day for sophistication of cinchona bark is past, on account of the cheapness of the same, and the check that is always held on it by the chemist's assay, it is interesting to become ac-

quainted with the histological distinction of the different barks. The author confines his remarks to the facts bearing upon the histology and upon the seat of the alkaloids in the barks, but reference must be had to the original paper, since it cannot be profitably condensed for this report. —Drug. Circ., Dec., 1896, 296–297.

Ipecacuanha—Histological Character of Distinction.—Dr. Albert Schneider publishes the results of a comparison made by him of the histological features of Rio and Carthagena ipecacuanha roots in "Journ. of Pharmacology" (iv. 1.). These results lead him to conclusions which are criticised by the editor of "Pharm. Journ." (Feb. 6, 1897, 112). Dr. Schneider says that it is possible not only to distinguish powders prepared from the two varieties of ipecacuanha, but also to detect the presence of a comparatively small percentage of Carthagena powder when present as an adulterant of Rio powder. It is said to be necessary to make at least ten examinations before formulating a conclusion as to whether or not the adulteration exists, but it appears extremely doubtful whether even then any one would be safe in deciding the matter on such evidence as Dr. Schneider considers sufficient. Thus he states that "the presence of single discoid starch-grains having a diameter of from 17μ to 23μ indicates the presence of the Carthagena powder," and this statement is printed in italics to render it more emphatic. But the starch-grains of Carthagena ipecacuanha can hardly be termed discoid, nor do they show such markings as appear in the illustration given by the author. The correct shape of the grains, which are in reality somewhat angular, was portrayed by Greenish two years ago (see Proceedings, 1895, 872), and the same work showed that they attain a size of 17μ to 22μ, the size being greatly dependent upon the age of the root. Dr. Schneider's conclusions appear, therefore, to be based on insufficient grounds.

Coffee—Detection of Adulteration in the Powder.—Prof. L. E. Sayre, at a meeting of the Kansas Academy of Science, read a paper on the detection of adulteration in the powdered coffee, which is published, with numerous illustrations, in Merck's Rep., April 1, 1897, 206, 207.

Gambier—Assay of Samples from Johore.—W. O. Richtmann has subjected six samples of Johore gambier, which became the property of the University of Wisconsin after the Columbian Exposition, to assay, with the results given in the following table:

Specimen Number.	Moisture.	Ash.	Tannin.	Catechin.
2900	12.37 per cent.	4.35 per cent.	39.63 per cent.	11.10 per cent.
2901	11.20 "	3.63 "	32.51 "	9.22 "
2902	1.38 "	3.65 "	40.51 "	9.39 "
2904	1.50 "	1.87 "	46.95 "	5.25 "
2905	8.37 "	3.77 "	22.21 "	8.68 "
2906	7.00 "	4.13 "	29.94 "	6.98 "

The moisture determinations were made by drying to constant weight on a water-bath drying oven, and the ash determined by incineration of the dried product. The tannin estimations were made according to a slightly modified process recommended by the Commission of German Technical Chemists in 1885 (see Trimble, "The Tannins," p. 43); and the catechin determinations by Trimble's method (see Proceedings 1888, 100), which is based upon the extraction of aqueous solution with ether. In specimens 2900 and 2901, small cavities appearing to have been formed by fermentation, the presence of *Penicillium glaucum* and *Aspergillus niger* were demonstrated. The highest percentage of tannin found corresponds with the percentage found by Trimble in commercial gambier, and it is noteworthy that in specimens examined by Trimble as in those examined by the author, those containing the highest percentage of tannin contained the lowest percentage of catechin. Specimens 2901 and 2905 correspond to the specimens of Johore gambier examined by Macewan in 1885, and also agree well as to tannin content.—Pharm. Rev., Feb., 1897, 27.

Palicourea rigida—Examination of the Leaves.—The leaves of this plant are known in Brazil under the name of

Douradinha, where they enjoy, according to Elfstrand, considerable reputation as a diuretic and diaphoretic, and are also said to act on the heart similarly to digitalin. C. G. Santesson has undertaken the chemical and pharmacological investigation of the drug, and has obtained a poisonous substance which is possibly identical with the *palicourine* of Peckolt. The residual mother liquors contain another, even more poisonous substance; but the whole subject evidently requires further investigation.—Arch. d. Pharm., *235* (March, 1897), 143–150.

CAPRIFOLIACEÆ.

Viburnum Prunifolium—Valerianic and not Caproic Acid a Constituent.—The statement of Francois that *viburnum prunifolium* contains caproic acid led Schamelhout to repeat his experiments. He prepared the ethyl and methyl esters of the acid and its metallic salts, and has proven that the acid is valerianic and not caproic.—Pharm. Jour., April 3, 1897, 290; from Annales de Pharm. (3) iii., 114.

LORANTHACEÆ.

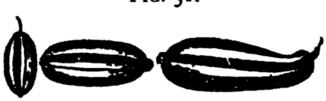
Viscum Album—Physiology of the Fruit and Seed.—G. Gjokié states that the threads of viscin, which are formed when mistletoe berries are opened, are derived from the membranes of cells which have been artificially drawn out. They give all the staining reactions of cellulose. The mucilage which surrounds the hypocotyl of the seedling is not identical with viscin; it is stained yellow by chlor-zinc-iodide, and a beautiful red by sesquichloride of ruthenium. The lignified elements of the endocarp of *viscum album* are reticulated cells and spiral vessels. The exceptionally strong

protection of the seeds of the mistletoe against evaporation, which enables them to germinate even in the exsiccator, depends on the development of a thick-walled cuticularized epiderm to the endosperm covered by a thick coat of wax.—Pharm. Journ., April 3, 1897, 289; from Sitzber. Akad. Wiss., Wien, 1896.

UMBELLIFERÆ.

Japanese Fennel—Distinction from European and Indian Fruits.—In a paper presented to the British Pharm. Conference, John C. Umney calls attention to the constantly growing demand for fennel, and that the fruit grown in southern Europe, which at one time dominated the market, has in recent years been almost wholly displaced by East India fennel. It appears now that the Japanese are beginning to be competitors of Europe and India for the supply of this drug, and the main purpose of the author's paper is to point out some characters of distinction whereby the Japanese fennel may be distinguished from both the others—the European and Indian fruits resembling each other very closely. The Japanese fruits, on the other hand, might by the careless observer be mistaken for anise; indeed, a recent importation has been described in the catalogue of one of the leading London brokers as "aniseeds." But a closer examination (see Fig. 51) shows the fruits to differ from anise in being more oblong and in not tapering at the apex. Each mericarp is traversed by five prominent ridges, and a microscopic examination of a transverse section of the mericarp shows at once that the vittæ are very large, either five or six in number, bordered by brown tissue. In anise there are twenty to thirty vittæ in each mericarp. Moreover the characteristic hairs on the surface of anise fruits are absent on the surface of Japanese fennel.

FIG. 51.



Fennel.
French, Indian, Japanese.

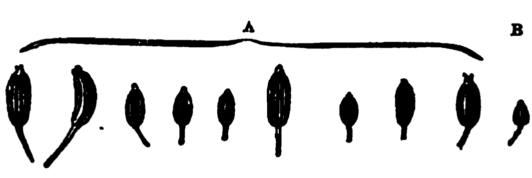
In odor there is a close resemblance between European and Japanese fennel, and the taste also, sweet at first and bitter afterwards, is similar to that of other varieties. The volatile

Oil of Japanese Fennel was obtained to the amount of 2.7 per cent. on distillation by steam. It is pale-yellowish, has the sp. gr. .9754 at 15° C., and an optical rotation of 15.5 in a 100 Mm. tube. It congeals at + 7° C., and reliquefies at + 10° C. Subjected to fractioning, results were obtained which make it evident that the Japanese oil differs but little from the oils obtained from French and Indian fruits. The probability is that it contains about 75 per cent. of anethol, in addition to fenchone (about 10 per cent.) and terpenes. The Japanese oil corresponds well with the requirements of the U. S. P.: sp. gr. not less than .960 at 15° C., and solidifying point between 5° and 10° C., though occasionally remaining liquid at a considerably lower temperature.—Yearbook of Pharm., 1896, 282–285.

Japanese Fennel—Similarity of Fruits Grown in Roumania.—William Kirkby calls attention to the fact that in 1879 Mr. E. M. Holmes had already mentioned a small variety of fennel fruit from Japan "with a taste at first strongly resembling that of anise" (see "Sho-ee-ko" in Proceedings 1880, 159), and that ten years later Messrs. Shimmel & Co. reported that under the name of "anise" they had met with a sample of Japanese fennel which, "although it had the aroma and taste of fennel, presented an extraordinary similarity in the form and size of the grain." Mr. Kirkby's interest in fennel was aroused by having submitted to him, in March, 1894, a sample of a parcel of ten tons of aniseeds grown in Roumania. The fruit agreed in every particular as to form and structure with fennel; in size it was about half as large, the average length being four millimeters, but its odor was decidedly anise-like. It could very easily be mistaken for fennel. The question, therefore, presents itself, is there a variety of fennel having a small fruit and having a more pronounced anise odor than the larger kind usually found in commerce? It is remarkable that two specimens, so much alike in size and color, and differing from the normal fruits, should occur in countries so remote from each other as Japan and Roumania. Mr. Umney's paper, the author observes, has given increased interest to the subject, but has not thrown much more light upon it. Perhaps he and Mr. Holmes will be able to do this when the fruits of the growing plants are examined.—Pharm. Journ., Aug. 22, 1896, 175.

Fennel—Commercial Varieties and Essential Oils.—Referring to his paper on Japanese fennel and Mr. Kirkby's criticism on the same, John C. Umney states that, with the view to making a comparison of all obtainable varieties of fennel, he has procured fruits from as many countries as possible, and from them distilled the essential oils. He gives a concise description of these fruits, of their histological character, and of the essential oils obtained from them. The accompanying illustration (Fig. 52) exhibits the external distinctions of the different fruits obtained, and the table shows their comparative sizes, as well as other characters, and also their respective yields of essential oils. The principal characters of the essential oils, and those of the features which are of the greatest importance as

FIG. 52.



A. Fennel Fruits.—1. German; 2. French (curved sweet); 3. Galician; 4. Russian; 5. French (bitter); 6. Italian; 7. Japanese; 8. Persian; 9. French (straight sweet).
B. Italian Anise Fruits.—(All drawings natural size.)

bearing more especially on the composition of the oils and consequently the odor and taste of the fruits, are included in the second table. In Mr. Umney's paper, microscopic sections of the different fruits are also shown, but these are most profitably consulted with the original text.

DESCRIPTION OF FENNEL FRUITS.

Variety.	Average length.	Average length of vittæ in transverse section.	Average breadth of vittæ in transverse section.	Percentage of oil.	Odor and taste of oil.
	Mm.	Mm.	Mm.	Mm.	
1. French (sweet)	7.8	.11	.04 to .05	2.1	Sweet, anise-like and fatty.
2. French (bitter)	4.5	.18 to .2	.07 to .08		
3. German (Saxon)	8.10	.2 to .22	.07 to .08	4.7	Sweet and very camphoraceous.
4. Indian	6.7	.1	.03 to .04	.72	Sweet and anise-like.
5. Russian	4.5	.2	.04 to .05	4.8	Very camphoraceous.
6. Galician	5.6	.2 to .22	.08 to .10	4.4	Very camphoraceous.
7. Persian	6.7	.15	.05	1.7	Sweet and anise-like.
8. Japanese	3.4	.15 to .16	.07 to .08	2.7	Very sweet and camphoraceous.

DESCRIPTIONS OF ESSENTIAL OILS.

Source.	Sp. gr.	Optical rotation in a tube of 100 Mm.	Melting point after solidification.	Percentage of fenchone.
Anise	.983 at 20° C.	—1	15.5° C.	None.
French fennel (1)	.976 at 15° C.	+16.0	12.5° C.	None.
" " (2)	.980 "	+16.5	11.7° C.	None.
Persian fennel	.977 "	+14	11.2° C.	3.4
Indian "	.968 "	+21	8.2° C.	6.7
Japanese "	.975 "	+15.5	10.0° C.	10.2
Saxon "	.974 "	+22	6.1° C.	22.5
Galician " (1)	.966 "	+22	4.0° C.	19.3
Galician " (2)	.965 "	+20	6.2° C.	18.1
Russian "	.967 "	+23	4.4° C.	18.2

Reviewing his results the author observes that Japanese fennel fruits do not approach so nearly as French or Persian to the odor of anise, although less pungent than Saxon, Galician and Russian varieties, and it seems clear that the misnaming of the fruits in the first instance was solely due to their resemblance in point of size to anise, as mentioned in his paper already referred to. In his opinion the Roumanian, Russian, Galician, Japanese and Saxon varieties of fennel are best adapted for pharmaceutical use, with a preference to the Saxon. In these fennels the percentage of oil is greatest, the flavor more decidedly agreeable, and the fenchone present is probably not without marked carminative properties.—Pharm. Journ., March 13, 1897, 225–227.

Anise and Star Anise—Comparison and Description.—F. H. Knowlton has commnnicated an interesting comparative description of the plants yielding true (*Pimpinella anisum*) anise and the star anise (*Illicium anisatum*) which, illustrated by several cuts, may be consulted in "Merck's Report," July 15, 1896, 352. Incidentally, the author calls attention to the fact that there are two species of *Illicium* found in this country, from Georgia to Florida and westward. They are known as anise-trees, the leaves and twigs, when bruised, exhaling an odor of anise, but beyond this they are of little economic value.

Caraway—Adulteration with Exhausted Fruits.—Dyer and Gilbrand call attention to the adulteration of caraway with "drawn" fruits. The authors found such exhausted fruits to contain only 0.1 per cent. of volatile oil, while genuine Dutch caraway examined at the same time contained 1.5 and 1.9 per cent. of oil—the latter being abnormally low, since Dutch "seeds" of fair quality should give over 5 per cent. of volatile oil. The "fixed ether extract" of the exhausted fruits was also found to be one-fifth less than that of genuine fruits. The exhausted fruits are much darker in color than the genuine.—Pharm. Journ., Aug. 15, 1896, 150; from Analyst., xxi. 208.

Conium maculatum—Alkaloidal Value of Different Parts of the Plant Grown in Different Localities in England.—E. H. Fair and R. Wright, in view of the fluctuation in the reputation of hemlock as a medicine from the earliest times, and particularly its present neglect by medical men after having been reinstated into favor during the latter half of the eighteenth century, have undertaken the determination of the alkaloidal value of specimens of the plant at different stages of its growth and from different localities. The results of their examination of the root, stems, leaves, flowering tops, and fresh green fruits, are shown in the following table, the figures given indicating the percentage of alkaloid obtained:

Stage of Development.	Roots.	Stems and Stalks.	Leaves.	Flowers with Peduncles.	Green Fruits.
1. Young plants, 4 to 6 inches high	.047	.017	.031		
2. Plants, 4 feet high, taken before flowering	.022	.019	.120		
3. Plants, 3 feet to 3 feet 6 inches high, showing incipient inflorescence.	(*a.*) Cortex, .031. (*b.*) Axis, .032.	.037	.090		
4. Plants, 5 feet high, in full flower	(*a.*) .050 (*b.*) .018	.061 .012	.187 .075	.236 .086	(1) .725 (2) .975

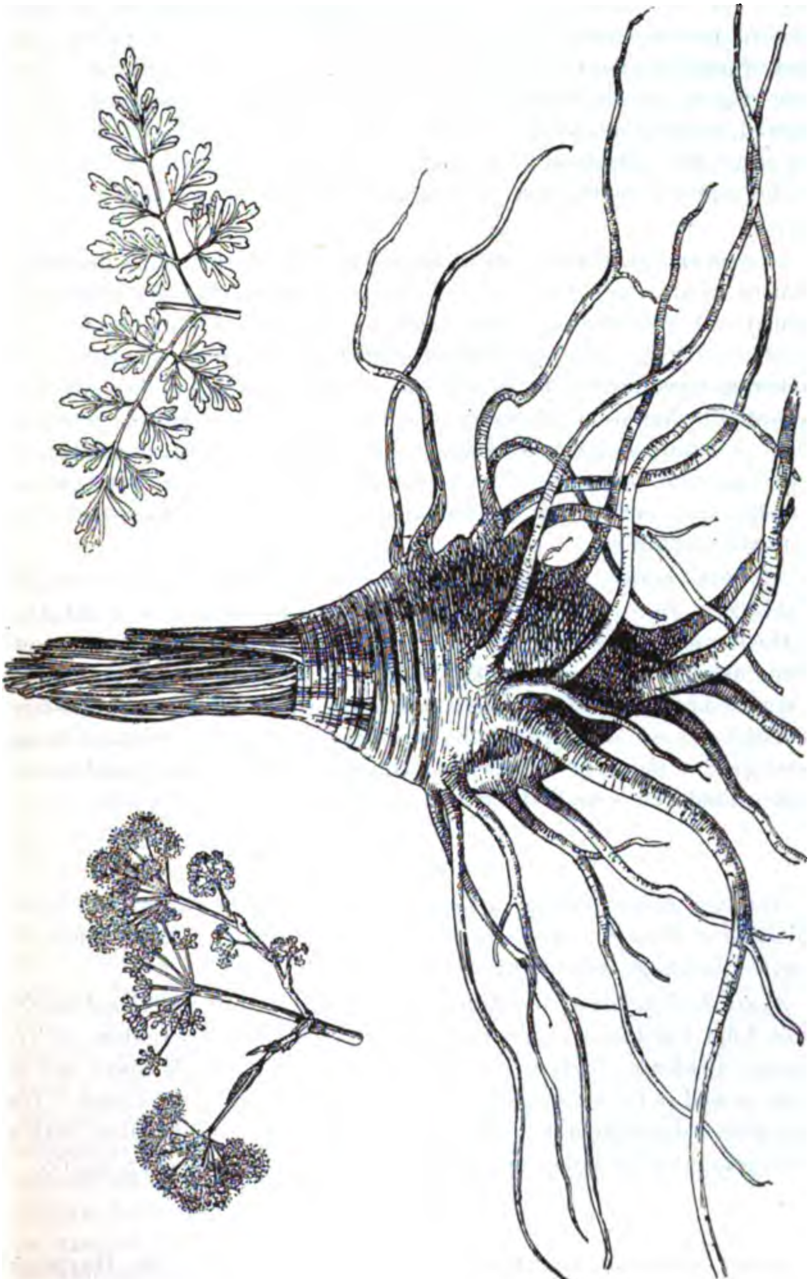
The plants Nos. 1, 3 and 4*a*, were grown at Uckfield; No. 2 at Hitchin, and No. 4 *b* at Ashford. The average loss on drying was: Roots, 77 per cent.; stems and stalks, 86 per cent.; leaves, 79 per cent.; fruits, 68 per cent. The percentages of alkaloidal hydrochlorate from green fruits collected during different years, were as follows: 1892, .935 and .975 per cent.; 1893, .896, 1.049 and 1.088 per cent.; 1896, .725 and .975 per cent.

The authors consider the question as to what ought to be the approximate alkaloidal strength of the preparations of the B. P., calculated from the range of dosage given, and call attention to the fact that the different preparations as found in pharmacy are sadly lacking in potency. The results above given are thought by the authors to amply confirm those of previous investigators, Drs. Christian and Manlius Smith, and particularly those of Dr. Harley, who clearly proved that the root, the dried leaves, and ripe fruit were almost entirely destitute of the active properties of the drug. They suggest that in a future Pharmacopœia the green fruit only be retained, and that a fluid extract be introduced from which other necessary preparations may be produced.—Yearbook of Pharm., 1896, 273–279.

Sumbul Root—Proximate Analysis.—John H. Hahn has subjected sumbul root to proximate analysis, with results as follows: Petroleum benzin extracted 17.25 per cent. of fixed oil, yellowish or yellow in color, becoming black-brown by age. It was thick, viscid, rather bland, but afterwards of a bitterish taste, and when rubbed between the fingers gave off a disagreeable odor. It is saponifiable, and soluble in alcohol, ether and carbon disulphide. When the oil is mixed with petroleum benzin, crystals are deposited, which were recrystallized from carbon disulphide, but not further examined. The drug contained 4 per cent. of moisture, and yielded 8 per cent. of ash. The author could gather no evidence that a large part of the sumbul root of commerce is fictitious, as implied by the query which he has endeavored to answer.—Proc. Penn. Pharm. Assoc., 1896, 75.

Sumbul—Cultivation in England.—E. M. Holmes states that the sumbul root of commerce has of late years been of very inferior quality compared with the fragrant root imported twenty-five years ago or more, and usually consists of smaller and more cylindrical pieces, with only a faint musky odor. It also shows other characters which distinguish it from the true musk-root, derived from *Ferula Sumbul*, and it seems, therefore, desirable that the true sumbul be cultivated, which he thinks may be done with advantage either in temperate and mountainous districts in the Colonies, or in ordinary gardens and fields in England. He had received two young plants of Ferula Sumbul some years ago, which have flourished under the care taken with them, but have not yet flowered. Recently he took up one of these plants for the purpose of transplanting. He found it to measure about 6 inches in length by 3½ broad, oval in shape, with

FIG. 53.



numerous rootlets that are somewhat twisted and spread nearly horizontally below the ground. The accompanying cut (Fig. 53) shows this

root, and also the leaves and flowers (the latter from another plant) in one-ninth the natural size. From the shape of this root it becomes obvious that it cannot furnish cylindrical pieces two or three inches long and of small diameter, such as occur in the drug of the present day. The root dug up by Mr. Holmes had a strong persistent musky odor where injured, exuding abundance of white milky juice. The chief difficulty to its successful cultivation is to obtain good seed, the fruits being liable to be ruptured by the rains in England.—Pharm. Journ., April 24, 1897, 347.

Asafœtida—Proximate Examination.—In continuation of his investigation of plant secretions, Prof. A. Tschirch communicates the results obtained by J. Polásek in his experiments on asafœtida, who summarizes his results as follows: The pure tears of *Asafœtida amygdaloides* contained the following constituents: 61.40 per cent. of resin soluble in ether, which is regarded by him to be the ferulic acid ester of asaresino-tannol; 0.60 per cent. of resin insoluble in ether, regarded to be free asaresino-tannol; 25.10 per cent. of gum; 6.70 per cent. of volatile oil; 0.06 per cent. of vanillin; 1.28 per cent. of free ferulic acid; 2.36 per cent. moisture; 2.50 per cent. impurities.

Asaresino-tannol has the composition corresponding to the formula $C_{24}H_{35}O_5$. The author has prepared a benzoyl derivative, $C_{24}H_{33}O_5.C_6H_5CO$, and an acetyl derivative, $C_{24}H_{33}O_5.CH_3CO$, which prove it to contain a hydroxyl group, *viz.*, $C_{24}H_{33}O_4.OH$. Umbelliferone was obtained as a secondary product of hydrolysis with sulphuric acid from asaresino-tannol, and was also obtained from ferulic acid synthetically, guaiacol being produced at the same time. By nitrification of asaresino-tannol picric acid is produced.—Arch. d. Pharm., 235 (March, 1897), 125–132.

RANUNCULACEÆ.

Aconitum Heterophyllum—Characters of its Alkaloid, Aticine, and identification of its acid constituent as *aconitic acid,* which see under their respective headings under "Organic Chemistry."

Hydrastis Canadensis—Botanical Description, History and Constituents. Prof. John Uri Lloyd communicates a brief botanical description of hydrastis canadensis, illustrated by a plate showing the plant in flower and in seed, as well as the various organs of fructification, and the rhizome. He also gives a description of its constituents and its history, together with a bibliography of his authorities, in Western Druggist, Feb., 1897, 59–60.

ANONACEÆ.

Anona Squamosa, L.—Medicinal Value of the Seeds.—Dr. Hartwich calls attention to the seeds of *anona squamosa*, L., a plant which, a native of the West Indies, is cultivated everywhere in the tropics on account of

its palatable fruit, called sweet-sop, sugar-apple, Pomme de Canelle, etc. The seeds are from one to five Cm. long, are of a grayish-brown color, smooth, and are blunt at one end, at which the small embryo lies in the cleft albumen. They contain powerful principles, and are regarded to be poisonous, being used by the natives of India as a remedy for head lice. The leaves of the plant are used medicinally as a sudorific, while the bark is used as a drastic cathartic. The seeds of other species of *Anona* seem also to act similarly to those of *A. squamosa.* Those of *A. muriatica*, L., *A. palustris*, L., and *A. spinescens*, Mart., are used to poison fish and to exterminate destructive insects.—Pharm. Rev., Oct., 1896, 231; from Gehe's Bericht, Sept., 1896.

BERBERIDACEÆ.

Berberis Aristata, D. C.—Description of the Bark, etc.—Prof. Hartwich describes the bark of the Nepaul barberry recently exhibited at Dresden along with other Indian drugs. It consists of rather small pieces, to 2 Cm. wide and perhaps 1 to 1½ Mm. thick, of marked yellow or, on the inner side, more of a blackish color. On the outer side, the pieces bear a rather soft cork, while on the inner side rather hard, sharply keel-shaped edges run lengthwise. In cross section immediately under the cork, here consisting of thin-walled cells, there can be distinguished in the middle bark crowded groups of stone-cells, then single groups of thick-walled, slender fibres, and, toward the inside, lastly, a connected layer of stone-cells, which also forms the keel-like projections. This striking structure becomes clear on comparison with pieces of the stem of the near relative, *Berberis Lycium.* The wood contains wide medullary rays which pass across into the bark. Into these rays, a sclerenchymatous ring lying in the bark sends keel-like projections which often reach into the wood and thereby split the medullary rays. The halves of the medullary rays thus formed run along on both sides of the keel. Thus in the cross section, from the sclerenchymatous ring and its projections, half circles are formed by the cambium and the adjacent wood. In these half circles lie the phloem bundles and a half of each of the two neighboring medullary rays. Both are thin-walled, and in the dry drug so shrunken that externally to the cambium a series of cavities is formed, which lends to the drug a very characteristic appearance. In this specimen the thin-walled phloem and the tissue of the medullary rays is lacking, having been rubbed away. The drug contains 2.205 per cent. of berberine. The other related alkaloids, oxycanthine and berbamine, occurring in the East Indian *Berberis* species, could not be with certainty identified, the quantity of drug at the author's disposal being too limited. From this species, as well as from *B. Lycium*, Royle, and *B. Asiatica*, Roxb., an astringent lasting extract of the consistence of opium is prepared in India, where it is known as

Rusot, or *Rasot.*—This extract is said to be the *Lycium* of the ancients. Since this is so often adulterated in India, the bark is used in preference to it. The bark is used, apparently with success, as a febrifuge also for diarrhœa and dyspepsia. The barks find technical use for dyeing.—Pharm. Rev., Oct. 1896, 232; from Gehe's Bericht, Sept. 1896.

MENISPERMACEÆ.

Sangol—Alkaloidal Constituents.—Messrs. Heckel and Schlagdenhauffen have subjected "sangol," a root used by the natives in Senegal and the French Soudan, to proximate examination. It is referred by them to

Cocculus Cæba, G. P. et Rich., and is very similar to *Pareira brava*, both in appearance and properties, being used in the treatment of periodic fevers. The authors have found in it about 2 per cent. of pelosine and about 3 per cent. of a new crystalline alkaloid, to which they have given the name of

Sangoline.—This melts at 188°, and in alcoholic or chloroformic solution rotates the plane of polarized light to the right. It is thrown down by water from its alcoholic solution, and does not give the color-reaction that is obtainable with sulphuric acid and an oxidizing agent from pelosine. The root also contains columbin. The plant is mentioned by Dymock as a common scandent shrub in the Punjaub, Scinde, Persia, Afghanistan, and Arabia, and that it is used as a febrifuge; while in "Watts' Dictionary of the Economic Products of India" it is said, on the authority of Murray, to be used as a partial substitute for hops in the manufacture of Indian beer.—Pharm. Journ., Oct. 3, 1896, 292; from Annales de l'Institute Coloniale de Marseille.

Pareira Brava—Histology and Distinction from the False Root.—Alfred R. L. Dohme observes that the distinction between true and false pareira brava are quite marked both macroscopically and microscopically, although a mere casual observer might mistake the one for the other, due to the similarity in appearance. The true root has a waxy fracture and cuts readily with a knife, while the false root possesses neither of these qualities. The true root is also less bitter in taste than the false root. Microscopically their difference is still more marked, in that the true pareira has in cross section a series of concentric rings of sclerenchymatic or stone cells with patches of wedge-shaped woody ducts arranged centrally in each ring. The false root in cross section shows no rings of stone cells, but one series of centrally arranged large wedge-shaped woody ducts.—Drug. Circ., Dec., 1896, 296.

Tinospora Cordifolia, Miers—Medicinal Use.—Prof. Hartwich calls attention to the stems and roots of *Tinospora cordifolia*, a climbing plant

which is native to tropical India and Indo-China, and furnishes the long-known drug of Indian medicine, called

Gulancha.—It apparently finds wide use as a fever remedy, in secondary form of syphilis, in rheumatism, and for snake bites. But little is known concerning its chemical constituents, which would form the subject of an interesting investigation. A small quantity of an alkaloid, which seems to be berberine, has been found, and a bitter tasting substance of a glucosidal nature—Pharm. Rev., Dec., 1896, 274; from Gehe's Bericht, Sept., 1896.

RUTACEÆ.

Jaborandi—Amount and Character of Alkaloid in Different Sorts.—Dr. B. H. Paul and A. J. Cownley have determined and examined the alkaloids in different sorts of jaborandi, viz., *Pilocarpus jaborandi*, *P. spicatus*, *P. trachylophus* and *P. microphyllus*, the three last named species having recently been described by E. M. Holmes (see Proceedings 1896, 594, 595). Such an investigation at the present time is particularly desirable, because of the growing scarcity of the leaflets of *Pilocarpus pinnatifolius*, and the substitution of the drug in commerce not only by the leaflets of other species of *pilocarpus*, but also in some instances by those from plants belonging to another genus. The results obtained by these authors are concisely given in the following table:

	Total alkaloid. Per cent.	Crystallizable nitrate. Per cent.	Recrystallized nitrate.	Melting point.
Pilocarpus spicatus........	0.16		{ 0.03 { 0.04	151.5° 130.5°
" trachylophus ...	0.40	0.02		
" jaborandi	0.72	0.67 (m. p. 161°)	{ 0.37 { 0.30	162.7° 158.3°
" microphyllus....	0.84	0.45 (m. p. 160°)	{ 0.23 { 0.22	162.7° 149.7°

From these results it is apparent that while the several kinds of jaborandi leaves met with in commerce differ considerably in the amount of alkaloid they contain, the product obtained is probably always a mixture of two or more distinct alkaloids. The question whether the alkaloids hitherto described as natural constituents of the leaves are products of the alteration of pilocarpine cannot at present be answered. In the case of one of the products, described as "pure pilocarpine nitrate" and melting at 141.7° C., they found that, after being heated in solution for fourteen hours in contact with air, there was a reduction of the melting point to 133°. The salt was still crystalline, and on recrystallization from alcohol, it was separated into two portions—one crystalline, amounting to 80 per cent. of the original quantity, melting at 138.2° while the other was gummy

and contained a base insoluble in water. Evidently there was partial alteration in this case. Another portion of the same salt was recrystallized from alcohol in fractions, but without any considerable alteration in the melting point being effected. The authors hope to follow up this inquiry by operating upon larger quantities of definitely authenticated material.—Pharm. Journ., July 4, 1896, 1–2.

Maranham Jaborandi—Observation of a Spurious Sort.—E. M. Holmes observes that while genuine jaborandi has for some months past been a scarce article, the small leaves of the Maranham jaborandi,

Pilocarpus microphyllus, have been procurable, and doubtless find ready sale on account of the good percentage of pilocarpine they yield to the manufacturer. But the author calls attention to the occurrence in the more recent importations of these leaves of a few bales of leaves almost indistinguishable from them to the eye of the casual observer, yet differing entirely in the absence of oil cells from their tissue. These spurious leaves, or more properly, leaflets, may be recognized by the absence of oil cells, by their reticulated venation, the veinlets being usually pellucid, by not tapering to a narrow base, and by the short, very hairy petiole. The upper surface is glossy, of a brownish-green tint, not greyish-green, as in *P. microphyllus*, and the midrib, on the upper surface, is minutely hairy, and the lateral veins form a more acute angle with the midrib. Usually there are small rounded or oval leaflets, about ½ Cm. long, mixed with the larger leaflets, which average 2½ to 3 Cm. long; these are never present in the true Maranham jaborandi, and should therefore at once serve to the unaided eye as a guide to the presence of the spurious drug. Mr. Holmes states that so far as he has been able to ascertain, the plant yielding this drug is hitherto undescribed. Ha believes it to be a species of *Swartzia*, and proposes for it the provisional name of

Swartzia Decipiens, being characterized and distinguished from the other members of the genus *Swartzia* by its leaves having four pairs of leaflets, with a terminal one, the leaflets having strongly reticulated venation, an emarginate apex, and being alternately arranged on the rachis; by the hairy ovary containing 10 ovules, the slender style as long as the ovary, the capitate stigma, and the short, inflated pod, about 1 Cm. long, sessile on a slender pedicel 1½ Cm. long. The different parts of the plant are shown in the accompanying cut (Fig. 54), but are insufficient for the absolute determination of the plant.—Pharm. Journ., July 4, 1896, 1–2.

Guaiacum Resin—Amount of Residue in Making the Tincture.—F. L. Smith calls attention to the large amount of residue remaining after the extraction of guaiacum resin by the process of the B. P. for the tincture. When this was afterwards completely exhausted with rectified spirit in a Soxhlet apparatus, and dried, it amounted to 15.7 per cent. of the guaia-

cum acted upon. An ash determination showed the presence of 3.36 per cent. in the resin. The author calls attention to this so that official cognizance may be taken in the forthcoming Pharmacopœia of the amount of debris permissible in guaiacum resin.—Pharm. Journ., Feb. 6, 1897, 101.

Quassia amara—Botanical Description and History.—John Uri Lloyd communicates a brief botanical description of *Quassia amara* (the original

FIG. 54.

Spurious Maranham Jaborandi.

a. Young twig, leaflets two-thirds natural size. *b.* Terminal leaflet showing portion of reticulated venation. *c.* Imperfect flower, showing ovary and style. *d.* Pericarp, one-half natural size. *e.* Young fruit with pedicel.

quassia), illustrated by a handsome plate showing the leaves, flowers, fruit, and their various organs. A native of Surinam, the plant is cultivated in warm countries, and in the hot-houses of Europe, on account of its beauty, and particularly of its bloom, which is of a bright red and exceedingly conspicuous. It is a small shrub or tree, bearing pinnate leaves, which are winged on the petiole, three to five foliate, and remind somewhat of those of the wafer-ash. The flowers are characterized by a large cone-like disk,

which supports the pistil. The five small sepals, five large showy petals, and ten stamens, are inserted near the base of the disk, and the five-carpeled ovary is supported on its summit. The fruit consists of five hard drupes, each containing a single seed.

According to the latest authority—Index Kewensis—the genus *Quassia* consists of three species: *Q. amara*, *Q. officinalis*—both from Surinam—and *Q. Africana*, a recently discovered species from tropical Africa. Numerous species, have, however, at various times been assigned to this genus, which was established by Linnæus in 1762, in order to receive the plant under consideration, but these are now considered distinct. Thus *Quassia excelsa*, Sw., a tree of Jamaica, which yields the quassia wood of commerce, belongs to a distinct genus, *Picræna*, which is still retained by the U. S. Pharmacopœia as a distinct genus, though it has now been united to the genus *Simaruba*. To the latter genus also belongs the tree which yields cedron seed, at one time classed as *Quassia cedron*, Bail. The main object of Prof. Lloyd's paper, however, is to throw some possible light upon the history of *Quassia amara*. The testimony of responsible authorities seems to establish beyond doubt, that in Surinam there existed during the last century a negro slave by the name of "Quassi," who was in possession of a secret remedy which he applied with great success in cases of the malignant fevers prevailing in that climate, and to this slave the record of quassia is traced. The author follows up the records upon the subject in their chronological order, by which the identity of the original quassia with *Quassia amara* seems to be established beyond controversy. It is interesting, therefore, that the quassia now official in the U. S. P., is not a *quassia* at all, but a *Simaruba* for which the Pharmacopœia retains the name *Picræna excelsa* (Swartz), Lindley. With his customary thoroughness, the author appends to his paper a bibliography of 29 papers, to which he refers for his authority.—West. Drug., Jan. 1897, 7–8.

Lunasia amara—A Glucosidal Cardiac Poison a Constituent of the Bark.—Professor Plugge has subjected the bark of *Lunasia amara* (*Rabelaisia philippinensis*, Planch.) which is used by the Negrites of the island of Luzon as an arrow poison, to proximate examination. He finds that it contains a very toxic glucoside, acting on the heart like digitalin, and of which 0.01 gr. (gramme? Rep.) kills a frog. While difficult to extract with chloroform, this solvent yields it in a colorless crystal on evaporation in a desiccator, which deliquesces on exposure to the air. The glucoside is soluble in water and alcohol, less so in chloroform.—Pharm. Journ., Aug. 29, 1896, 178; from Arch. de Pharmacodynamie, ii., 537–555.

Toddalia aculeata, Pers.—Description of the Root, etc.—Prof. Hartwich gives a description of the root of *Toddalia aculeata*, a plant found in India, Ceylon, Southern China, the Archipelago and Mauritius. This root has been known as "Lopez root," since the middle of the seventeenth

century, though there is some doubt as to its identity with the original "Lopez root," which came from Zanzibar. The drug consists of pieces often much flattened out, reaching a length of 20 Cm. and a thickness of 4 Cm. The wood is pale yellowish. The bark, even in large pieces, is only 1.5 Mm. thick, brownish in cross-section, externally bright yellow, covered with a cork which is easily rubbed off. The wood has narrow medullary rays, one to two cell rows wide. The cells are radially elongated, pitted. The wood rays contain many vessels and strongly thickened fibres; wood parenchyma very sparingly present. Exteriorly the bark shows a strong corky layer which consists of unthickened, rather high cells. The primary bark contains parenchyma with single crystals, secretory cells and groups of fibres. The inner bark shows medullary rays, which are one to three rows wide. The cells are radially elongated, and occasionally contain crystals of oxalate. Towards the outside, the medullary rays broaden out in a fan-like form. They are unusually high; in tangential section some were found as much as sixty cells high. The fibres, not strongly thickened, appear as slightly marked tangential bundles in the bark. In the soft bark, tangential groups of small, collapsed sieve-tubes are seen, the sieve plates of which are oblique in an insignificant degree. In the bark rays many single crystals of oxalate are present in rather long, axial rows of cells and surrounding the fibre bundles, as well as secretory reservoirs with yellowish, granular contents.

The drug seems up to the latest time to have come but sparingly into commerce. It is used, apparently with good results, as a tonic stimulant, especially useful in fevers and dysentery. The activity appears to be confined to the bark, the woody portion of the root being tasteless and regarded worthless.—Pharm. Rev., Dec., 1896, 274.

Mangifera Indica, L.—Medicinal Uses of the Unripe Fruit.—Prof. Hartwich observes that while mangoes in their ripe condition are a much esteemed fruit in the tropics, having a characteristic though terebinthinate taste, the unripe fruits serve medicinally as an astringent, since they contain considerable tannin. The taste is also somewhat peppery. The single fruits, as received from India, are a few centimeters in size, wrinkled by drying, of a blackish color, the embryo still only slightly developed. In the wall of the fruit are many schizogenetic, secretory reservoirs. The dried flowers of the mango plant, which are also astringent, are likewise used medicinally, especially in diarrhœa.—Pharm. Rev., Nov., 1896, 257; from Gehe's Bericht, Sept., 1896.

Citrus vulgaris—Development of the Fruits.—M. Biermann has studied in detail the developmental history of the fruit of *Citrus vulgaris* and of related species, and developes a number of interesting points. The oil reservoirs of this family, the *Rutaceæ*, are usually referred to the lysigenetic order of formation, i. e., arising by the absorption of a group of cells, as distinguished from the schizogenetic method, arising as an intercellular

space by the separation of cells. Dr. Biermann finds that in reality the reservoirs in question arise primarily in a schizogenetic manner and are subsequently enlarged lysigenously. Calcium oxalate crystals are present in different parts of the fruit wall. The crystal arises in the plasma of the cell and on reaching the proper size surrounds itself with a membrane consisting of unmodified cellulose. Thus enveloped, the crystal crowds away the protoplasm at one side of the cell and frequently attaches itself to the wall. The glucoside, hesperidin, characteristic of the younger stages, is dissolved in the cell sap in quantities varying with the age. When the fruits have a diameter of from 5 to 15 Mm. this constituent reaches its maximum amount, about 10 per cent. It is most abundant in the parenchyma of the wall of the fruit and in the central, columnar mass of tissue. As maturity approaches, the amount of hesperidin diminishes. Tannin behaves in the reverse manner, being more abundant in the ripe fruit than in the younger stages. The fleshy pulp of the fruit is made up of long, clavate structures containing the characteristic juices. These structures arise as conical projections from the epidermal and subepidermal tissues of the chambers of the ovary, and already exist in a rudimentary condition at the time of blooming. Each of these clavate projections consists of an outer tissue of tangentially elongated, thickened elements enclosing polygonal cells with extremely thin walls. When they nearly fill the chambers of the growing fruit, the transitory starch present in the cells is changed to some sugar capable of reducing Fehling's solution, probably dextrose. At the same time they become turgid with juices. —Pharm. Rev., May, 1897, 95; from Arch. d. Pharm., 235 (Mar., 1897), 19–27.

Shaddock, or Grape Fruit—Correction.—Referring to Mr. LaWall's paper on "Shaddock, or Forbidden Fruit," in the March, 1896, number of the *American Journal of Pharmacy* (see Proceedings 1896, 605), J. H. Hart, Superintendent of Botanical Department, Trinidad, observes that the illustration No. 1 is certainly not a shaddock, but a grape fruit, or forbidden fruit. There exists much confusion in the classification of the members of the *citrus* family, and no reliance can be placed upon the common names employed to designate them. The author would let *Citrus aurantium* represent the orange of the St. Michael's type (sweet orange), with all its varieties, and he would let *Citrus decumana* cover all the shaddocks, grape fruit, or pumelows, etc., and their varieties, which are also very numerous; while *Citrus nobilis*, or the tangerine and mandarin (interchangeable name), appear to maintain themselves fairly distinct. In Jamaica, shaddock is shaddock and nothing else, the largest fruit of the *Citrus* tribe. Grape fruit, or forbidden fruit, presents as many characters as other varieties of citrus: red flesh, white flesh, sour, bitter, sweet; but the one called grape fruit hangs in clusters—6 to 8 together—hence the name.—Amer. Jour. Phar., April 1897, 181, 182.

Indian Bael—The Pulp Regarded the Active Portion.—A. C. Abraham, in a paper read before the Brit. Pharm. Confer., calls attention to this official drug of the B. P. The remedy is apparently not popular, since it has not been adopted by other European Pharmacopœias. He, nevertheless, considers bael an efficient astringent remedial agent, believing that the remedy has not had a fair official trial, and that, in so far as the fluid extract is inefficient, it is due to a bad process of preparation, for which the Pharmacopœia is primarily responsible. The directions of the B. P. result clearly in the elimination of the pulp of the fruit, which the author claims is the essential part, and in this opinion he is supported by clinical experiments which have been made by the medical authorities of the Royal Infirmary. It was found in these experiments that the pulp separated by filtration, checked chronic dysentery at once, while the same doses of fluid extract had much less effect. The author therefore recommends a modification of the B. P. process for the fluid extract (which see under Pharmacy). Yearbook of Pharm., 1896, 348–351.

GERANIACEÆ.

Erodiums—Californian Species.—A recent item mentioning the hemostatic value of *Erodium cientarium* has prompted L. D. Morse to call attention to several Californian species, of which there are four, all of them astringents. The most common are *Erodium cientarium* and *E. moschatum*, the leaves of the latter having a musky odor. Another variety is *E. macrophillum.*—Merck's Report, Aug. 1, 1896, 384.

Culli Colorado—Chemical and Microscopic Examination.—K. Peinemann has subjected the hard, thin, roundish cakes, used popularly in Chili as a remedial agent under the name of *Culli colorado* and *Panes de Vinagrillo* as a remedial agent to chemical and microscopical examination. The samples examined varied in their diameter from 9 to 22 Cm., but are probably larger than the average article of commerce, being evidently selected. They are composed of vegetable matter, of which *Oxalis rosea* doubtless furnishes the principal constituent; but with this the author has determined the presence of other undetermined plant-parts, not referable to *Oxalis rosea* or *Oxalis dumetorum*, the last named being mentioned as the principal ingredient by Schroff. The author is inclined to consider the chief additional substance to be derived from a plant belonging to the *Amaryllidaceæ* or *Liliaceæ*. Besides these the cakes evidently contain the stems and leaves of several grasses.

The chemical examination of the cakes revealed the presence of 11.804 per cent. of oxalic acid, which is present in the form of primary potassium oxalate. Payen had found in the *fresh* stems of *Oxalis crenata*, Jacq., 3.23 per cent., which corresponds well with the amount in the dry cakes examined: but he found it to exist as ammonium oxalate, while in the cakes

examined the potassium compound only was found.—Zeitschr. Oest. Apoth. Ver., Aug. 20, 1896, 614–617.

Monsonia ovata—A South African Astringent.—Dr. J. Maberly publishes a long record of cases in which he has used a tincture prepared from *Monsonia ovata*, a South African plant belonging to the Geraniaceæ, which has been successfully used in the treatment of dysentery. The tincture was prepared with rectified spirit in the proportions of 2½ ozs. to the pint. The plant is an annual, growing in the Vaal river district and probably elsewhere in South Africa. It must be collected in January or February. Its properties are presumably astringent, like those of *Geranium maculatum*.—Pharm. Jour., Feb. 27, 1897, 162; from Lancet, Feb. 6, 1897, 368.

STERCULIACEÆ.

Cocoa—Detection of Added Alkali in the Powder.—Depaire, after a long series of experiments, finds that prepared cocoa powders contain from 25 to 39.2 per cent. of fat, and 3.4 to 6.7 per cent. of moisture. The aqueous solution of the ash from 100 grammes of such cocoa requires for saturation from 34 to 92 Cc. of decinormal acid. Thus the ash from a dry cocoa containing 40 per cent. of fat should not reasonably be expected to use up more than 100 Cc. of decinormal acid for every 100 grammes of cocoa burnt. All alkali in excess of this figure may be regarded as "added." The figures obtained for the ash from 100 grammes of this cocoa will be increased by 153 Cc. for each gramme of added potassium carbonate, and by 190 Cc. for each gramme of added sodium carbonate. —Pharm. Journ., Dec. 5, 1896, 490; from Bull. de la Soc. Roy. de Pharm. de Brux., xl, 233.

Cacao—Determination and Percentage of Theobromine, which see under "Organic Chemistry."

Kola—Method of Assay.—Carles finds it essential that the kola should be in very fine powder in order to extract the whole of the alkaloids—theobromine and caffeine—nothing coarser than a 120 powder giving up the whole of its alkaloidal constituents. The presence of a certain amount of moisture is also requisite for complete exhaustion. The following is the method he recommends: 10 grammes of the fine powder are mixed intimately with 1 gramme of slaked lime and 20 grammes of alcohol (80 per cent. by volume). This is dried on the water bath with occasional agitation until the mass weighs 14 grammes; it is then rubbed down in a mortar and introduced into a small flask fitted with a long glass tube condenser, and mixed with 35 Cc. of a menstruum composed of 100 grammes of chloroform and 20 grammes of alcohol (93 to 94 per cent. by volume). The mixture is digested on a water bath for one hour, filtered, the residue extracted in a similar manner three times more, with 35, 30 and 25 Cc. of the menstruum respectively. The bulked filtrates are evaporated to dry-

ness, and the residue is treated with 10 Cc. of boiling water acidulated with 4 or 5 drops of 1 per cent. sulphuric acid, then with 6 Cc. of boiling water, and lastly with 5 Cc. These aqueous extracts are mixed, evaporated to dryness, and weighed. The weight multiplied by ten gives the percentage of theobromine and caffeine in the nuts. When it is simply needed to determine the "kolanine" or the combination of alkaloids with kola-tannic acid, the powder is first exhausted with cold water, which removes the free caffeine, and then extracted with alcohol (70 per cent. by volume), which dissolves the kolanine. This alcoholic solution is evaporated to an extract, treated with cold water, which leaves the crude kolanine insoluble; it is then dried and weighed. To determine the richness of this kolanine in alkaloids, 1 gramme of it is triturated with a gramme of slaked lime and a few grammes of alcohol (70 per cent. by volume), 3 grammes of chalk are added, and the whole dried until it weighs 6 grammes. This residue is then treated with chloroform-alcohol mixture as described above for the nuts.—Pharm. Journ., Oct. 3, 1896, 289; from Annales de Chim. Analyt., i., 345.

False Kola—Occurrence in the London Market.—The "Pharm. Journ." (Oct. 31, 1896, 380), calls attention to a large shipment of seeds from St. Domingo to London, under the name of kola nuts, which are apparently leguminous and resemble closely the seeds of *Dimorphandra (Mora) excelsa*, said to be used in the island as food for cattle. These seeds are kidney-shaped, about 2 to 2½ inches long, 1½ inch wide, and about ¾ to 1¼ inches thick, and marked transversely with a deep, narrow sinus.

Helicteres Isora, L.—A Mucilaginous Drug from India.—Prof. Hartwich calls attention to the root, bark and capsules of *Helicteres Isora, L.*, which are now imported from India. The plant is found in East India and the Malay Archipelago both as tree and shrub, and spreads even to North Australia. The mucilage-containing root is used like *Althæa;* its bark is valued in India as a remedy for diabetes. The follicular capsules, twisted spirally around one another, as they have come to us, are used for cramps in children.—Pharm. Rev., Oct. 1896, 233; from Gehe's Bericht, Sept., 1896.

TERNSTRŒMIACEÆ.

Persian "White" Tea—Source.—The "Kew Bulletin" mentions that the white tea of Persia, which comes from Tonking, is composed of the undeveloped leaf buds so thickly coated with fine hairs as to give them a silvery appearance. The leaves are derived from the Assam tea plant,

Camelia theifera, Griff., found wild in some parts of Assam and Burma, but now largely cultivated in Burma, Tonking, etc. The tea is known on the London market, where it is rarely seen, as flowery Pekoe Congou.—Chem. & Drugg., Jan. 2, 1897, 16.

GUTTIFERÆ.

Gamboge—Composition.—According to Sassarini, gamboge contains the following constituents: 1, a gum analagous to arabin; 2, an essential oil, boiling at between 160° and 210° C., and containing a terpene and a camphor; 3, isovitinic and acetic acids; 4, a phenolic ester; 5, a resin; 6, methyl alcohol and other higher homologues; 7, a liquid with a fruity odor, boiling at a high temperature, and presenting the character of an aldehyde or an acetone. He regards the phloroglucin reported as present by other experimenters to have been a decomposition product.—Drug. Circ., June, 1897, 162; from Ann. di Chim. Farm.

Gamboge—Examination of Commercial Samples for Starch.—E. G. Eberhart has examined three samples of "pipe" gamboge and one sample of powdered gamboge, and found them to yield from 76 to 81 per cent. of resin to alcohol, but to be free from starch. He believes it possible that when starch is found in the powder, it is due to carelessness in cleaning the mill after powdering some starchy drug. He proposes the following test for the presence of starch, which is based upon the solubility of the resin as well as the starch in solution of caustic alkali, and the reprecipitation of the resin by the addition of acid in excess, while the starch remains in solution. In 5 Cc. of solution of potassa, 1 Gm. of powdered gamboge is dissolved with stirring; then 45 Cc. of distilled water are added, and lastly an excess of hydrochloric acid, the whole being stirred until uniformly of a bright yellow color. The thin magma so obtained is poured upon a pellet of absorbent cotton, loosely inserted in the neck of a small funnel. The almost colorless liquid which drains off is tested with a drop or two of iodine solution. If starch is present in quantities larger than 2 per cent., a dark blue color will be produced.—Proc. Indiana Pharm. Assoc., 1896, 48–50.

Garcinia purpurea, Roxb.—Medicinal Uses of the Fruit, Seeds, etc.—Prof. Hartwich calls attention to *Garcinia purpurea*, Roxb., a plant which is indigenous to India and Indo-China. The sour-tasting outer covering of the fruit is used as a remedy for scurvy. The seeds furnish an oil which is also used and is known under the names of

Kokum or *Goa-Butter* (Kokam chatel Bhirandel, etc.). They are from one to two Cm. long, about one Cm. broad, brown, kidney-shaped. The embryo contains in its cells besides crystalline fat characteristic aleurone grains and, in certain cells, tannin. They also contain about thirty per cent. of the before-mentioned oil or fat, of which with the imperfect apparatus employed only about ten per cent. is obtained. It is quite hard, almost powdery, white or yellowish; later it takes on a brownish tinge. It has a faint odor; its taste is mildly oily, becoming after a time rancid. It melts at from 40°–41° C., and contains glycerides of stearic, myristic

and oleic acids and also free fatty acids. It furnishes a hard soda-soap. It is said to be used for the adulteration of melted butter. It is probable that the fat does not possess any especial medicinal qualities. It is used like cocoa fat and also as a substitute for cetaceum.—Pharm Rev., Oct., 1896, 233; from Gehe's Bericht, Sept., 1896.

HIPPOCASTANEÆ.

Horse-Chestnuts—Use as an Emulsifier for Empyreumatic or Hydrocarbon Bodies.—Durand suggests the use of powdered horse-chestnuts for emulsifying tar oils, oil of cade, and other empyreumatic or hydrocarbon bodies—the method being particularly useful for the preparation of veterinary liniments. Fifty parts of powdered horse-chestnut and sufficient water to make 100 parts of liquid are placed into a capacious vessel, 900 parts of tar oil or other body added, and the whole is well shaken. A perfect emulsion immediately results, and remains permanent after repeated shaking.—Pharm. Journ., Aug. 15, 1896, 154; from Journ. de Pharm. (6) iii., 395.

VITACEÆ.

Sherry Wine—Modification of B. P. Requirements.—E. W. Lucas has subjected six samples of sherry wine, obtained from importers in good standing, to analysis, and publishes the results in a table. These show that none of the samples contained the percentage of alcohol—17 per cent.—required by the B. P., the percentages found being 15.45, 13.00, 13.80, 15.40, 11.69 and 13.90 per cent. He observed that the U. S. P. requires only 10 to 14 per cent. of alcohol by weight, and expresses the belief that the B. P. has either fixed too high a standard, or that the sherries of the present day are made to contain less alcohol than formerly. He, therefore, suggests a reduction of the standard in the next B. P., and that a more detailed description of the wine be given, as follows: A pale, yellowish-brown Spanish wine, made by fermenting the juice of fresh grapes freed from seeds, stems and skins. The specific gravity at 60° F. should not be less than .985, nor more than 1.010. The residue when dried during twelve hours at a temperature of 212° F. should not be less than 2, and not more than 5 per cent. by weight. One hundred Cc. should not require less than 5 and not more than 10 Cc. of normal potassium hydrate solution for neutralization (limit of free acid). The wine should not contain more than 4 per cent. by weight of sugar. The wine should not yield by distillation more than 14 per cent., or less than 11 per cent. by weight of absolute alcohol. Sherry wine should not contain citric acid or free tartaric acid, and should be entirely free from salicylic acid, from aldehyde or other preservatives.—Pharm. Journ., Nov. 7, 1896, 397.

Red Wines—Examination for Foreign Coloring Matters.—Albin Belar communicates a method for the detection of foreign coloring matters in

red wines, which is based upon the observation that most coal-tar colors dissolve readily in nitrobenzene, whilst the blue or red pigments of plants, and the similar coloring matter of red wine, are absolutely insoluble in nitrobenzene. The detection is effected as follows: To 5 Cc. of red wine about an equal quantity of pure nitrobenzene is added in a test-glass. The contents are at first gently shaken; in presence of magenta the nitrobenzene takes at once a bright red color. If the nitrobenzene remains unaltered, the mixture is shaken more strongly. To remove the emulsion, the mixture is gently heated, when the emulsion disappears. The nitrobenzene collected at the bottom of the test-tube becomes, for some time, perfectly clear, and permits of the recognition of the smallest traces of any magenta which may be present. After some trials, it becomes possible to recognize any magenta in the single drops of nitrobenzene which adhere to the sides of the tube after shaking. By using suitable quantities of nitrobenzene, all the magenta can be withdrawn from the red wine, so that a quantitative colorimetric determination can be effected by means of this solvent. A series of other pigments were examined by the same method as to their behavior with nitrobenzene. The experiments were made first with watery then with alcoholic solutions; afterwards Istrian and Dalmatian red wines were mixed with small quantities of the following pigments. The results were alike in each case. From a watery solution of methylen blue, nitrobenzene takes up a part of the coloring matter. The nitrobenzene takes an emerald-green color. The following pigments are dissolved by nitrobenzene without change of color: Magenta, purpurine (alcoholic solution), and safranine (alcoholic solution). Eosin dissolves with a vinous red, and the solution in nitrobenzene displays no fluorescence. The aqueous part, not dissolved in nitrobenzene, appears yellowish. In rosolic acid the residual aqueous part, insoluble in nitrobenzene, has a yellow color. Extract of indigo (sodium disulphindigotate) is quite insoluble in nitrobenzene, and behaves exactly like anthokyan (the blue coloring matter of plants). The experiments on the interesting behavior of nitrobenzene with various coloring matters are being continued.—Chem. News, Oct. 16, 1896, 197; from Zeitschr. Anal. Chem., 1896, Part 3.

Wines—Recognition of Naphthol Yellow S, etc.—Alberto d' Aguiar and Wencelau da Silva have experimented on wines colored with naphtha yellow S, brilliant yellow S, diamond yellow, turmeric and fustic, as well as on natural wine, by the process below given, with results which were positive with the first three, but negative with turmeric, fustic and natural wine. A portion of the wine is strongly acidified with sulphuric acid, and shaken up with amylic alcohol, which extracts all the coloring-matter derived from the coal-tar and a part of the natural coloring-matter of the wine. After decantation and filtration the amylic alcohol is agitated with an excess of ammonia, and allowed to remain at rest until it is permanently limpid. The natural coloring-matter of the wine, as also various other

matters, are precipitated by the ammonia. The amylic alcohol retains in solution a portion of the coal-tar color sufficient for its detection by dyeing-tests or by reagents. The amylic solution is shaken up with water and acidulated sulphuric acid; after standing it is evaporated, in contact with a thread of silk, with a few drops of ammonia. The silk is then distinctly dyed, and the residue left by the amylic alcohol is next submitted to the action of sulphuric and hydrochloric acids and ammonia, to allow of a study of the changes produced by these reagents.—Chem. News, May 28, 1897, 256; from Compt. Rend., No. 18, 1897.

Red Wines—Action of Zinc.—L. A. Lovat finds that zinc denaturates red wines and renders them poisonous. Hence the use of this metal should be severely forbidden in the cock for casks, vats, etc., containing such wine.—Chem. News, Febr. 26, 1897, 107; from Compt. Rend., cxxiv., No. 5.

DIPTERACEÆ.

Dammar Resin—Source and Composition.—Tschirch defines dammar as a resin derived from plants belonging to the *Dipteraceæ*, *Coniferæ* and *Burseraceæ*, and principally from the species of *Hopea*, *Vatica* and *Dammara*. A sample of dammar was examined in Dr. Tschirch's laboratory by G. Glimman. It was a commercial variety from Batavia, supposed to be derived from a plant of the nat. ord. *Dipteraceæ*, and yielded on analysis the following constituents: *Dammarolic acid*, $C_{56}H_{80}O_8$, a crystalline compound amounting to 23 per cent.; *α-dammar-resin*, $C_{11}H_{17}O$, soluble in alcohol, melting at 65°, and amounting to 40 per cent.; *β-dammar resin*, $C_{31}H_{52}O$, insoluble in alcohol, but soluble in chloroform, melting at 200°, and amounting to 22.6 per cent. The impurities amounted to 8 per cent., the water to 2.5 per cent., the ash to 3.5 per cent. and the loss to 0.5 per cent.—Arch. d. Pharm., *234* (Nov. 1896), 585–589.

LINEÆ.

Coca—Cultivation.—Charles Ledger observes that owing to the European demand, the cultivation of coca has considerably increased, especially in Peru. The great distance from the seaboard prohibits the extension of cultivation of coca in Bolivia, as well as in the valleys in the departments of Puno and Cuzco, in Peru. As is well known, coca is chewed by every Peruvian, Bolivian and Argentine Indian. The shrub, which is 5 to 7 feet high, yields its first crop when eighteen months old and continues to bear about forty years. There are two pickings yearly, viz., in April and September—the latter is considered the best and most abundant. The leaves are laid out in a paved drying-yard, and afterwards pressed in drums (tambors) of plantain-leaves; the tambor, weighing 46 lbs. net, is divided in the middle by a layer of plantain-leaf into two cestos of 23 lbs. net each. The end of each tambor is covered by a rough woolen cloth,

especially made for the purpose in the country. Coca yields about 60 lbs. to the acre, and the Bolivian coca is considered superior to that grown in Peru, although the latter country produces double the quantity, or 16 millions of pounds. The Peruvian coca is grown in the valleys at lower elevation than the Bolivian, and is packed in bags of rough woolen make, each containing 20 lbs. net, and called cesto.—Chem. and Drugg., Jan. 30, 1897, 182.

Coca Leaves—Improved Process of Estimating Total Alkaloids.—Alexander Gunn, with the view to ascertaining the cause of the disagreement between the assay of the leaves and of spirituous preparations of coca, and for the purpose of determining a rapid and reliable process for the determination of the total alkaloids in coca, has made a large number of parallel experiments with the same quantity and quality of leaves, but employing different solvents and precipitants as outlined in the table below appended. He reviews the different processes that have been recommended, and which have already been criticised by Prof. v. d. Marck (in "Analyst," June, 1889), and concludes that Lyons' Ammoniated Ether process is one based on sound principles; the only objection being that it requires twenty-four hours to complete, though there is no doubt that the extraction of alkaloids is complete. As a result of his experiments, he has successfully modified this process, so that it may be completed in about two hours, as follows: Five grammes of the powdered leaves are dampened with a weak solution of ammonia (about 2 per cent.) and allowed to stand for half an hour; then placed in a narrow tubular percolator (10 inches long and of ½-inch bore) and percolated with ammoniated ether until 100 Cc. have collected. This is shaken out with three washings of a 2 per cent. solution of hydrochloric acid, collecting about 50 Cc. of the washings. This acid solution is now washed once with ether, then made alkaline with ammonia, and the alkaloid shaken out with three washings of ether. The collected portions of ether are transferred to a weighed porcelain dish, the ether blown off, and the residue dried at 75° C.

TABLE OF RESULTS.

Expt.	Outline of Treatment.	Alkaloid Obtained..
1	Acetic ether	.420 per cent.
2	Magnesia, damped, acetic ether	.512 "
3	Ether	.176 "
4	Magnesia, damped, ether	.508 "
5	Magnesia, damped, then dried, ether	.236 "
6	As expt. 2, but dried	.292 "
7	Damped with 2 per cent. sol. ammon., ether	.504 "
8	Damped with 2 per cent. ammon., dried, then moistened again, ether	.460 "
9	Damped with AmOH sol., ether-chloroform	.540 "
10	" " " chloroform	.408 "
11	Ammoniated ether	.552 "
12	Damp with AmOH sol.. ammoniated ether-chloroform	.468 "
13	" " " " ether-acetic ether	.484 "
14	Water with 2 per cent. HCl	.368 "
15	2 per cent. solution sod. salicyl. in water	.376 "
16	$Ca(OH)_2$, damped ether	.436 "
17	V. d. Marck's process	.200 "
18	69 O. P. spirit, evaporated	.100 "
19	Absolute alcohol, evaporated	.080 "
20	Proof spirit, acidulated, evaporated	.404 "
21	" " not driven off	.548 "
	Average result by new method	.572 "
	" " Lyons' method	.574 "

The author's experiments have, furthermore, satisfied him that heat is quite inadmissible at any stage during the extraction of the alkaloids, but that the presence of spirit does not materially affect the results of an analysis. But the method of estimating spirituous preparations of coca will depend a good deal upon the strength of spirit. If the preparation is a 1 in 10 tincture of proof strength, 50 Cc. are slightly acidified with dilute hydrochloric acid, and shaken up with ether, which will of course dissolve in the spirit. Water, q. s., must then be added until the ether separates. The ether is drawn off, and the acid liquid again shaken with ether, and this is repeated until no more coloring matter is taken up. Then make alkaline with ammonia, and shake out the alkaloid with three washings of ether.—Pharm. Journ., Sept. 19, 1896, 249, 250.

MELIACEÆ.

Azadirachta Indica, Juss.—Description of Leaves and Root-Bark.—Prof. Hartwich calls attention to the leaves and root-bark of *Azadirachta Indica*, the stately "Nimb" tree of India, Ceylon and the Malay Archipelago. In India all parts of the plant are used medicinally, but the leaves and root-bark, in particular, enjoy a reputation as anthelmintic. *The leaf* is pinnate with terminal leaflet and with from nine to fifteen pairs of leaflets. The single leaflet is long-acuminate, dentate-sinuate. The taste is very disagreeable, nauseating, not bitter, however, nor slimy. The microscopic investigation has not brought to light any especially characteristic elements

or cellular arrangements. In the glandular cells of the upper surfaces, small oxalate concretions are found, around the vascular bundles, single crystals. The cells of the spongy parenchyma are on the under side, rather closely set together and somewhat elongated, so that here a palisade tissue is formed, although little apparent. The vascular bundles show on each side a layer of fibres. The epidermis-cells of the upper side are often in considerable groups, divided by transverse walls so that in areas a hypodermis is formed. Whether these cells contain mucilage could not be determined, since in order to render the tissues distinct very strong reagents must be used. These leaflets occasionally occur among Tinnevelly senna leaves. *The root-bark* consists of very fibrous pieces, externally reddish-brown with yellowish-brown corky areas, internally whitish, obliquely striate. The whitish cross-section under the lens shows no brown spots. The bark tastes bitter, gives with water a whitish extract which, it is worth while to note, contains no tannin. The inner bark has medullary rays two or three cell-rows in width; the bast rays are plainly composed of alternating groups of fibres and interposed soft bast. The latter can be recognized by a narrow zone of grouped sieve-tubes in the middle of each layer.—Pharm. Rev., Oct., 1896, 231; from Gehe's Bericht, Sept., 1896.

PAPAVERACEÆ.

Poppy—Cultivation and Prepartion in India.—Alexander McDonald, with a view to meet some inquiries from the Southern States, reports upon the cultivation of the poppy and the preparation of opium in Persia. From this it appears that the poppy is by no means difficult to cultivate; but to bring it to a state of maturity to produce opium requires very considerable knowledge, and unremitting care and attention. All Persian opium is cultivated on irrigated land, which is the best adapted for this crop, because it places the moisture necessary to the successful growth of the plant practically under the farmer's control. The great difficulty which meets the amateur grower is to know the exact time when the plant arrives at maturity; for without this knowledge all his efforts will be frustrated. All the plants on a plot will not mature at the same time, but each one has to be examined separately. If the incision for extracting the opium is made too early, nothing but white sap will exude; and if too late, the juice will have dried up. The author gives practical directions, which, except when interfered with by climatic influences, should be carefully observed. As to the preparation of the drug for the market, this is usually done by the merchants, and but rarely by the cultivators, the business requiring buildings and utensils beyond the reach of the latter. It appears, therefore, that the successful cultivation must depend upon two skilled persons,—one the cultivator and the other a kneader. Without these the enterprise would be a failure.—Amer. Jour. Pharm., Aug. 1896, 435–438; from U. S. Consular Reports, vol. 51, 83

Opium—Character of Chaff Present.—At a meeting of the College of Pharmacy of the City of New York, Jan. 19, 1897, some memoranda on opium adulteration by George Massey were read, together with a report by Dr. Jellife upon the character of the chaff found by him in several samples which had been submitted to him by Mr. Massey for examination. A microscopic examination revealed the following substances, which the author designates as adulterants: No. 1. Plant hairs such as are found on the poppy stalks, thin-walled cells resembling the pulp of fruits, and five per cent. of starch. In No. 2 the thick-walled cells of the poppy capsule. In No. 3 the thin-walled cells of the poppy leaf, pollen grains, indicating that the juice had been collected while the plant was still in flower, and five per cent. of starch. In No. 4, characteristic large grains of wheat starch to the amount of ten per cent., in addition to the thin-walled cells of the poppy head. In a specimen, designated as No. 6, twenty-five per cent. of chaff was contained, including half-inch pieces of poppy capsules, poppy leaves, cotton and woody fibres, possibly camel's hair and bark fibres.—Amer. Drugg., Jan. 25, 1897, 41.

Opium—Presence of Starch and Strontium.—Lyman F. Kebler and Charles H. LaWall call attention to the occurrence of starch in opium that has been subjected by them to examination during the past two years. The occasional presence of starch in abundance in Egyptian opium is mentioned in "Pharmacographia," and has also been noticed in Persian opium by Mjöen, and, more recently by Dr. Jellife (see above). Of six samples of opium sent to the authors by Mr. Moerk, all from three to five or six years old, every one contained wheat starch, the amount varying from a trace to 8 per cent. The authors make some suggestions concerning its estimation in opium, but conclude that its presence in so complex a product as opium is of no importance so long as the percentage of morphine in the sample comes up to the official requirements, since the presence of starch does not conflict with a correct estimation of the alkaloid. It is very different, however, with a substance or substances that do increase the apparent yield of morphine. Such substances have been already noticed by one of the authors (Mr. Kebler, see Proceedings 1896, 805), who called attention to the fact that the amount of impurity associated with the crystallized morphine as obtained by the U. S. P. process, was abnormally great. The situation has not changed for the better since, opium assayed during the past few months yielding unusually high results. The amount of this impurity was estimated by the ash method, and on repeated examination of the ash, strontium was indicated in every case as the impurity. The authors give analytical results showing the variations that have been found due to the presence of strontium in different samples of opium, their results being confirmed by parallel assays made by Dr. Squibb's chemist, Mr. Smith.

The question naturally arises, can starch, or epidermal tissue, or rumex

seed, or strontium sulphate, or calcareous salts found in Turkey opium be classed as adulterants of opium in the true sense of the word? The authors express the opinion that opium, as it comes into the market, being the concrete juice of the poppy, mixed with various and sundry substances, it is difficult to define what constitutes an adulterant, but that the presence of a substance like strontium sulphate, which increases the apparent yield of morphine, ought to be looked upon as an adulterant of a fraudulent nature.

In this connection the authors give the results of assay of ten cases of opium from one consignment, obtained under the most favorable conditions, in reference to temperature, amount of washings and time of shaking out the morphine. The yield of *crude* morphine ranged from 12.33 to 12.78 per cent., calculated for dry opium from 15.34 to 15.89 per cent., while, corrected by the ash method, the yield of pure morphine averages in the first 5 samples 11.36 per cent., in the second 11.64 per cent. This uniformity in the quality of opium has hitherto been unnoticed in assaying large consignments, and the circumstance of the presence of wheat starch in the opium, and strontium in the ash, would indicate a previous manipulation of a large quantity of opium before packing it into cases for shipment. But under this view it is perplexing that the yield of morphine is still several per cent. higher than the limit required by the custom house, since it would be just as easy to reduce the morphine to the required legal standard of 10 per cent.—Amer. Jour. Pharm., May, 1897, 244–249.

Chinese Opium—Smoking Value.—In a previous paper (see Proceedings, 1896, 610), Frank Browne, Acting Government Analyst at Hong Kong, had recorded some observations on the smoking value of Chinese opium. Further testings have since been made, and the results of two series of independent observations by experienced Chinese smokers have been communicated in a paper read before the Brit. Pharm. Conference (1896). As the result of these observations the author concludes that, although Chinese opium has been shown, especially in two varieties, to contain larger quantities of morphine than are present in Indian opium, it is noteworthy that the three opium extracts here experimented with (Kweichou, Yünnan and Szechuen) are greatly inferior, as regards narcotizing power, to Indian opium extract.—Yearbook of Pharm., 1896, 362.

Opium—Determination of Morphine by the B. P. Process.—E. H. Farr and R. Wright review the B. P. process for the determination of morphine in opium, criticising the various steps, and conclude that for general pharmaceutical use no better process has yet been published. The only faults in the process are that the dried morphine invariably contains some impurity, and will never neutralize the theoretical amount of standard acid; and there is a loss of morphine in the mother liquor and ether from which it has been precipitated, amounting on an average to 0.1 gram for every hundred cubic centimeters of filtrate operated upon. These sources of

error can be eliminated by the following modification of a process for the assay of the tincture, which is equally applicable to liquid extractions from the opium itself, the amount of such being conformed to the amount of opium in the tincture directed in the method:

Take 80 cubic centimeters of the tincture and evaporate by a gentle heat until the volume is reduced to about 20 cubic centimeters; mix this thoroughly in a mortar with 3 grams of freshly-slaked lime, and dilute with water to 85 cubic centimeters, stirring occasionally during half an hour; then filter into a 4-ounce bottle having a wide mouth fitted with an accurately-ground stopper, 50 cubic centimeters, add 2 grams of ammonium chloride, 30 cubic centimeters of ether and 5 cubic centimeters of alcohol; shake well at intervals during half an hour, then set aside for twelve hours. Next remove the ethereal layer by means of a pipette, rotate the contents of the bottle with a further 15 cubic centimeters of ether, and when the latter has completely separated, remove it as before by means of a pipette and filter through counterpoised filter papers placed one in the other. Wash the filter with a little ether, and then let the residual ether evaporate from the paper. Next collect the whole of the crystals on the inner paper, rinsing the last portions out of the bottle and washing the crystals with morphinated water until the washings are colorless. Dry the crystals, at first by pressure between folds of filtering paper, then at a gentle heat, and finally at 110° C. for an hour, then weigh.

Take .3 gram of the crystals and dissolve in a slight excess of $\frac{N}{10}$ sulphuric acid and titrate back with $\frac{N}{10}$ soda solution, using litmus paper to indicate the end reaction.

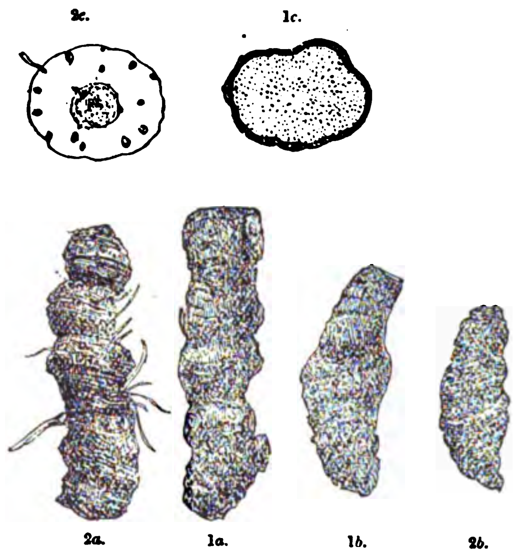
To the amount of pure anhydrous morphine in the total amount of the crystals, as indicated by the titration, add .05 gram, representing the average amount of morphine lost in the process. The combined weights multiplied by two will be the percentage of morphine in the liquid.—Pharm. Journ., March 6, 1897, 202, 203.

Opium—Results of Assay.—Al. Kremel has determined the amount of water and morphine in commercial opium (Vienna, Austria). In fourteen samples he found from 7.6 to 17 per cent. of water; in one of these the low percentage of 5.22 per cent. of morphine, the others yielding from 8.00 to 12 per cent of morphine. He also determined the morphine in six samples of the powder, which yielded from 10.05 to 12.60 per cent.—Zeitschr. Oest. Apoth. Ver., Sept. 10, 1896, 685.

Sanguinaria—Presence of Helonias Rhizomes in the Commercial Drug.—E. M. Holmes calls attention to a commercial sample of the rhizome of *Sanguinaria canadensis* that recently came under his notice, containing in admixtures, to the extent of about 40 per cent., the rhizomes of *Chamælirium carolinianum*, Willd., better known as *Helonias dioica*. The latter being much more expensive than blood-root, the admixture is doubtless due to carelessness or ignorance. The two rhizomes are very like in shape,

but differ slightly in color. The accompanying cut (Fig. 55) shows the close resemblance of the two rhizomes. Mr. Holmes describes the principal characters of distinction, the most marked being in the transverse sections. In the case of *Sanguinaria* rhizomes, the transverse surface, when cut, shows either a uniform dark blood-red color or a whitish starchy surface with numerous red dots scattered over it. The root bark forms a thin blackish line. The transverse surface of *Chamælirium* is of a dirty white hue and horny texture, and exhibits a well defined central column occupying about one-third of the diameter, and containing irregularly

FIG. 55.



1. **Sanguinaria Canadensis.**—*1a*, Showing annual growth. *1b*, Showing traces of leaf scars. *1c*, Transverse section, magnified.

2. **Chamælirium Carolinianum, Willd.**—*2a*. Showing annual growth and endogenous character of rootlets. *2b*, Younger rhizome. *2c*, Transverse section, magnified.

placed vascular bundles. The outer portion surrounding the central column shows a few scattered holes containing traces of the rootlets, but there are never any red resinous dots present, as in *Sanguinaria*. It is easily detected, therefore, by the greyish surface perforated with small holes, and by the transverse section exhibiting a well-defined central column.—Pharm. Journ., July 11, 1896, 21.

CRUCIFERÆ.

Raphanus Niger.—Isolation from the root, properties, etc., of a volatile crystalline body, *raphanol*, which see under "Organic Chemistry."

Woad—Manufacture and Continued Use by Yorkshire Dyers.—Francis Darwin and R. Meldola have recently visited an English woad mill, the

substance being still employed by some old-fashioned Yorkshire dyers in conjunction with indigo, in the so-called "woad vat." The primitive method of manufacture is still conducted, and is described by the authors as follows: The leaves of the plant, *Isatis tinctoria*, are wrenched off at the base by the pickers, the root being left undisturbed so as to permit the growth of a second crop. The first process consists in crushing the leaves to a pulp under three hollow wooden rollers, round the circumference of which about two dozen iron cross-bars are arranged to serve as effective crushing edges. The resulting pulpy mass is kneaded by hand into balls, which are then placed on wooden trays to dry in open sheds. When dry they are again ground up under the rollers, and the crushed material is allowed to ferment after sprinkling with water. This final stage completed, the woad is ready for market. The object of first drying the pulp and then wetting it again before fermentation is not obvious, but the fermentation itself is probably a zymolytic decomposition of glucosides.—Pharm. Jour., Nov. 28, 1896, 457; from Nature, lv., 36.

DROSERACEÆ.

Drosera filiformis, Raf.—Characters of the Leaf.—George M. Beringer, having his attention attracted by a peculiar condition of *Drosera filiformis*, Raf., growing in the pine barrens of New Jersey during the month of September, observed at the base of each plant a small globular bud, covered with a mass of pale brown hair, which proved on closer inspection to be the small plantlet which nature had already provided for the next year. The plant is, therefore, evidently a perennial, and the author's observation affords additional confirmation of the more modern classification of the sundews as *Sarraceniales* with *Sarraceniaceæ* and *Nepenthaceæ;* the leaf character of this *Drosera* indicating a near relationship to *Nepenthes.*—Amer. Jour. Pharm., Dec. 1896, 675–677.

CUCURBITACEÆ.

Cucurbitus Pepo, Linné—Yield and Character of Oil from the Seed.—Ferd. A. Sieker has prepared the oil from pumpkin seed in February, 1896, and examined it in March, 1897. He obtained 30 per cent. of oil of a reddish-yellow color when seen in thick layers, soluble in ether, petroleum ether, benzene and carbon disulphide, but insoluble in alcohol. Its sp. gr. at 15° C. was 0.9231. It failed to solidify with nitric acid and copper after 3 or 4 days contact. The iodine number, in two estimations, was 118.84 and 118.14. The acid number was 29.04 and the ester number 165.77, making the saponification number 194.81. A commercial sample was examined for comparison. It had a yellow color, corresponded to that of the author, however, in its solubilities and behavior to nitric acid and copper. The smallness of the sample prevented a sp. gr. determination. The iodine number was found to be 113.7.

PASSIFLORACEÆ.

Carica Papaya—Alkaloid and Glucoside in the Leaves.—Van Ryn has obtained from the leaves of *Carica Papaya* an alkaloid, "carpaine" (which see under "Organic Bases"), and a glucoside, "carposide." The latter was obtained in the form of a very hygroscopic mass of small, white needles, which reduced Fehling's solution after hydrolyzation.—Pharm. Journ., May 29, 1897, 466; from Ned. Tjd. voor Pharm., ix.

COMBRETACEÆ.

Kinkèlibah—An African Remedy for Hæmaturic Bilious Fever.—Inquiries having of late been made concerning an African remedy bearing the name of "kinkèlibah," and which has been stated to be "the only good remedy for the hæmaturic bilious fever which is so fatal to Europeans in West Africa," and it being desired that the remedy be tried in Eastern Tropical Africa, where the same disease prevails, the "Pharm. Journ." (Feb. 13, 1897, 121, 122) republishes the description of the plant.

Combretum Raimbaulti, given by Dr. E. Heckel in 1891 (see Proceedings 1892, 579), while the name "kinkélibah" is used for the remedy by the Susa people, from Rio Nunez to the neighborhood of Sierra Leone, the Woloff people call it "sekhaou" and "khassaou," and sometimes "lakhass." It is abundant in the Rio Pongo district, and is found in Dubreka and Mellacoré, but does not seem to occur in Sierra Leone, although found opposite Free Town.

The "Pharm. Journal" adds that the plant was recently found by Mr. G. L. Scott-Elliot on the laterite hills behind Sierra Leone, at an altitude of about 600 metres. It is therefore easily obtainable, and if its reputation proves to be well founded it would be worth cultivation in the eastern districts of tropical Africa. Prof. Engler suggests that it is worth inquiry whether the somewhat similar East African species—*C. brunneum*, in Djurland, and *C. Schumanni*, in Buiti—are likely to produce the same remedial effects.

MYRTACEÆ.

Eucalyptus rostrata, Schlecht—Distribution in Australia, Character of its Kino, etc.—J. H. Maiden, Government Botanist of New South Wales, has communicated a valuable paper on the

Murray Red Gum and its Kino, which was read at a pharmaceutical meeting of the Philadelphia College of Pharmacy. Mr. Maiden designates this as "Murray red gum" to distinguish it from other Eucalypti which are also known under the name of "red gum," as the red gum of Western Australia, the product of *Eucalyptus calophylla;* of St. Vincent's Gulf, South Australia, the product of *E. odorata*, while in New South Wales, *E. tereticornis* and *E. punctata*, as well as *Angophora lanceolata*, are trees that are also known as "red gum." The Murray "red gum" tree is *Eucalyptus*

rostrata, but it is known in the interior of Western and South Australia also as the "flooded gum," and in western New South Wales is called "creek gum." The

Kino of Eucalyptus rostrata is usually chosen for medicinal purposes because this species, being very gregarious, it cannot be easily mistaken for any other species in the districts in which it occurs; because it is a comparatively free yielder of kinò, and because of its superior properties. The manner in which the kino is procured is as follows: A tree is selected from which the kino is or has recently exuded; a cut is made into the tree beyond the gum-vein, a piece of trough-shaped tin is inserted into this cut, and the kino allowed to run into buckets or kerosene tins—the latter being the two-gallon containers in which kerosene reaches the remotest parts of the Australian colonies from the United States. The kino as it exudes is of the consistence of molasses and has a sourish odor, but in a few days dries into a solid mass, which subsequently becomes quite friable. This property allies this kino to Mr. Maiden's "turbid group" of kinos, and distinguishes it from his "ruby" and "gummy groups," which do not become friable with age, and can, therefore, be collected by simple picking from the bark of the trees producing them. While as much as 4 gallons of red gum kino have been procured from a single tree, the average is not more than 1 quart per tree, and from a majority of trees no appreciable quantity is obtained—in many cases none at all. The author gives the results of the examination of two specimens of "red gum" kino collected in different localities in 1888, the one of Victorian origin, the other from Wilcania. The results may be tabulated as follows:

Sample from	Victoria.	Wilcania.
Catechin and tannic acid	84.3	82.7
Ligneous matter, etc.	.3	.6
Moisture	15.2	15.8
Ash	.2	.9
	100.0	100.0
Tannic acid determination (Loewenthal)	46.22 per cent.	47.746 per cent.

Both samples are freely soluble in cold water, the Wilcania sample dissolving almost immediately, leaving only a whitish sediment, and forming a pale-brown liquid, whilst the Victorian sample dissolved fairly readily, and almost entirely to a reddish-brown liquid. Incidentally the author also calls attention to the economic value of the essential oil and its properties, quoting from authorities that have heretofore been reported upon.

As to the distribution of *Eucalyptus rostrata*, this is very wide in Australia, usually on the banks of rivers, or on river flats subject to inundation, or in old water-courses. It becomes dwarfed in the interior; but it attains its greatest development on the banks of the Murray River, which is nearly 2,000 miles long, and forms the greater part of the boundary between the

colonies of New South Wales and Victoria.—Amer. Jour. Pharm., Jan., 1887, 1–7.

Myrica Nagi—Coloring Matter of the Bark.—Perkin and Hummel have isolated the coloring matter contained in the bark of *Myrica Nagi*, an evergreen tree occurring in the sub-tropical Himalayas, the Khasia Mountains, the Malay Islands and in Japan. The yellow coloring matter closely resembles quercetin, forming yellow needles, but contains more oxygen, its composition being $C_{15}H_{10}O_8$. It forms orange to orange-red crystalline compounds with sulphuric, hydrochloric, hydrobromic and hydriodic acids, which are decomposed by water into the free acid and coloring matter. The acetyl derivative yields with fused alkali phloroglucol and gallic acid. The results of the investigation show that this coloring matter, for which the authors propose the name

Myricetin, is most probably an hydroxy-quercetin. The amount of this coloring matter varies from 0.23 to 0.27 per cent., but it contains a large percentage of tannin—27.30 per cent.—and is therefore used as a tanning agent, occasionally also for medicinal purposes.—Amer. Jour. Pharm., Oct. 1896, 572; from Proc. Chem. Soc., 1896, 145.

Pimenta—Adulteration.—C. A. McPherson had his attention directed to some pimenta which was characterized by having a uniform reddish color, whilst, as usually met with in commerce, it is a mixture of various shades, ranging from grey-brown to dark brown. Under the lens the suspected berries were seen to be coated with some pigment, which could be washed off, and proved on chemical examination to be ferric oxide—probably in the form of Armenian bole.—Pharm. Journ., Jan. 23, 1897, 75.

Punica Granatum—Botany, History, Constituents and Uses.—Prof. J. U. Lloyd contributes a paper on the botanical character, history, constituents and uses of *Punica Granatum*, L., accompanied by an illustration showing a flowering branch, the fruit, and other organs of the plant, and concluding with a bibliography referring to 44 papers consulted by him.—Western Drug., May, 1897, 202–205.

Jambul—Value in Diabetes.—Dr. Colasante confirms the value of jambul in the treatment of diabetes, employing the drug in four forms, the powder of the fruit and of the bark, and the fluid extract of these two parts, in daily doses of from 10 to 100 grammes. All are equally efficacious, but the fluid extracts are more pleasant to take, the larger doses of the powders sometimes giving rise to a slight diarrhœa, otherwise no ill effects were observed in any case. All the cases treated showed a general improvement, with increase of weight and of strength. The volume of the urine secreted, and the amount of sugar in it, diminished markedly, the glucose sometimes disappearing almost completely.—Rev. de Thérap. Méd. Chirurg. lxiii, 92; from Therap. Woch., 1896.

Guava—Constituents of the Leaves.—Khouri has examined guava

leaves, and finds that their astringent properties are due to tannic (psiditannic) and gallic acids. These, together with an essential oil, account for the use of the leaves as a remedy in diarrhœa and dysentery, and in dyspepsia.—Pharm. Journ., Oct. 3, 1896, 292; from Annales de l'Institut Coloniale de Marseille.

Psidium pomiferum, L.—Description and Use of the Root, Bark and Leaves.—Prof. Hartwich describes the root, bark and leaves of *Psidium pomiferum*, L., received among other East Indian drugs. Both of these enjoy in India—where the plant, indigenous to America, is now cultivated for the sake of its palatable fruit—and the West Indies, a considerable reputation as an astringent—the root-bark in cases of diarrhœa in children, the leaves as a fever remedy in kidney diseases, and externally in rheumatism, St. Vitus' dance and cramp in children. The *leaves* have short petioles, reach a length of 12 Cm., a breadth of 5½ Cm., and are broad, oval, acuminate, entire, the margin somewhat thickened. Under the lens they are shown to be translucently punctate. The odor is faint, resembling that of senna leaves; the taste bitter aromatic. The structure shows nothing especially characteristic. Oxalate in sacs and in separate crystals are noticeable, particularly around the mid-vein. The vascular bundles show near the phloem and xylem parts a layer of bark fibres. In the mesophyll, secretory reservoirs of a type common to the myrtaceæ are found. The *bark* forms small pieces of a millimeter thickness, varying exteriorly from greenish-gray, on the inside light brown. The cross section shows a thin cork composed of three or four layers of flat cells with brown contents. It is plain that an abundant cortex formation takes place, since the bark joins immediately onto the cork. The medullary rays are one to two—rarely three cell rows wide, the cells radically elongated, nine to (rarely) seventeen cell rows high. One can distinguish tangential layers of crystal-bearing cells which in the dried drug contain much air and, therefore, appear almost black, and layers free from crystals in which the sieve tubes are found. In longitudinal section, two forms of crystal cells are seen: those present in considerable number—as many as eight—one above another containing one crystal each, and more isolated cells containing small crystals in large numbers. In the deeper parts of the bark, one or more narrow zones of small, strongly thickened, frilled, stone cells appear. The bark has no secretory reservoirs. The author observes as far as the not entirely clear description of the bark of *Psidium guayava*, by Dymock in Pharmacographia Indica (II. p. 31), allows conclusions to be drawn, the two agree. It is probable also that this plant does not differ materially from *P. guayava* as to chemical constituents, the bark of the latter containing 27.4 per cent. of tannin.—Pharm. Rev., Nov., 1896, 257; from Gehe's Bericht., Sept., 1896.

LYTHRACEÆ.

Lawsonia inermis, L.—Histology, etc., of the Leaves.—Prof. Hartwich has had opportunity to examine the leaves of *Lawsonia inermis*, L., which were received along with other East Indian drugs recently exhibited at Dresden. The leaves furnish the

Hennah, a favorite dye-stuff of the Orientals, with which the women color the nails of the hands and feet, etc. While these leaves have not been put to any important medicinal use, they have been used in dropsy and are applied in leprosy, and to wounds and ulcers. Their most important ingredient is tannin, which is characteristic; they also contain 2 per cent. of resin, which is green from the presence of chlorophyll. The leaves reach a length of 6 Cm. and a breadth of 2.5 Cm. They are acuminate, ovate, narrowed into the short petiole; the secondary veins branch off from the mid-vein at an angle of about 60°. In the outer half they curve towards the top and unite with the next higher vein. The mid-vein has fibers only on the under side. The vascular bundle is bicalatual, the wooden part crescent-shaped. The epidermis cells of both sides are rectilinearly polygonal and have stomata. The upper side has two rows of palisade cells, and in the spongy parenchyma are two layers of ovulate sacs, very characteristic for this leaf.—Pharm. Rev., Nov., 1896, 257; from Gehe's Bericht, Sept., 1896.

ROSACEÆ.

Rose—Substitution of the Oil for the Petals in Galenical Preparations.—Wm. C. Alpers proposes the substitution of oil of rose for the fluid extract in the officinal preparations in which the latter is now used. He also makes some practical observations on the preparation of fluid extract of rose and rose water, which see under "Pharmacy."

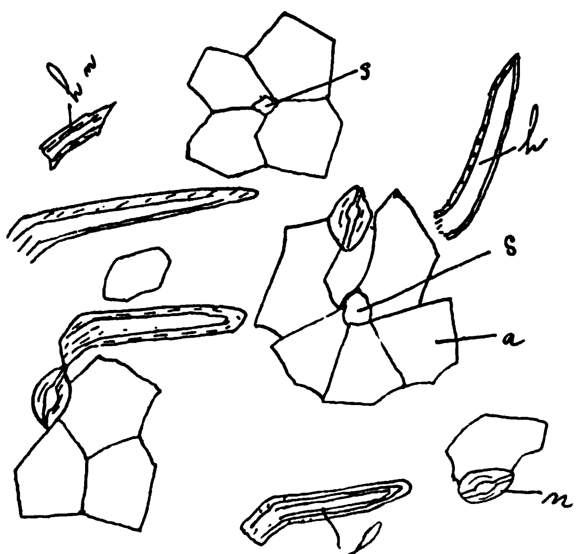
Brayera anthelmintica, Knuth—(Hagenia Abysinnica, Willd.)—Botanical Distribution.—The tree yielding flores koso, the well known anthelmintic, for a long time was known to grow only in Abyssinia. Later it was found also on the Kilimandsharo, where it grows at an altitude of from 1,400 to 2,800 meters. Recently it has been found by Dr. Buchwald near the source of the Kwasinde in Usambra, where it grows along the borders of woods in clearings at a height of 1,700 meters, and the possibility of exporting the drug from this German colony is therefore suggested.—Pharm. Rev., Nov. 1896, 261.

Cepa caballo—An Astringent Root from Chili.—Prof. C. Hartwich, under this name, which is also applied to other plants, describes a root which in Chili is derived from *Acæna splendens*, Hock. et Arnott, and which bears considerable resemblance to Rhatany. It is, however, deficient in tannin, containing only 5.6 per cent. in the root bark, which is the most astringent portion.—Zeitsch. Oest. Apoth. Ver., Sept. 1, 1896, 645–646.

LEGUMINOSÆ.

Senna—Microscopic Distinction of the Powder from Different Sorts.—L. E. Sayre observes that the two sennas, Alexandrian and Indian, in the powdered state, have many points of resemblance and few of diversity, but that under the microscope there are two points of difference that even a moderately acute observer will notice, viz.: the small number of hairs in the case of India senna and the much greater number in the Alexandria, and the dissimilarity of form of the epidermal cells. In the India senna there will be noticed from one to three plant hairs if 25 milligrams of the powder mixed with 5 Cc. of diluted alcohol be examined under the lens; while in the Alexandria variety there will be from eight to twenty or more. These plant hairs almost invariably remain unbroken in the powder, and are distinguished by those of the Alexandrian variety having a sharp curve near the base, while those of India senna are straighter, shorter and

FIG. 56.



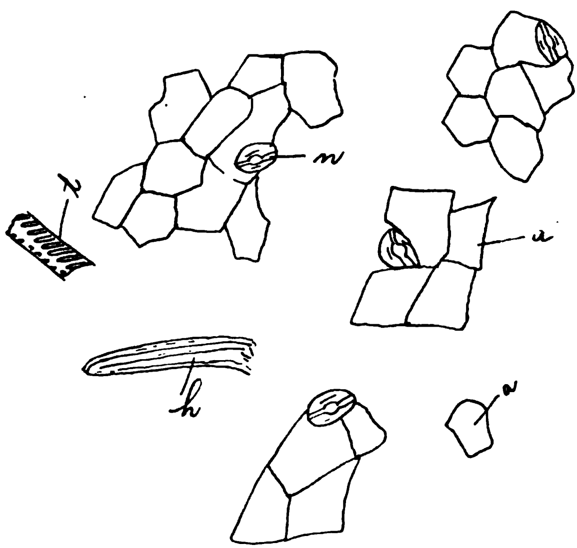
stouter. The epidermal cells of India senna are somewhat smaller and more uniform in size, and the angles more acute than in the Alexandria, but this distinction requires more expert observation than that of the hairs. Both of these distinctions are shown in the accompanying cuts (Fig. 56 Alexandria senna and Fig. 57 India senna).

The author also gives some instructions for detecting the presence of powdered *chestnut leaves*. This is revealed under the lens by the tracheids and pitted cells which compose the midrib of the chestnut leaf; and also

by the rapidity with which the tannin of the latter reacts with a drop of solution of ferric chloride under the conditions described by the author. —Amer. Jour. Pharm., Nov., 1896, 585–588.

Referring to the foregoing as being in the nature of preliminary work, Prof. Sayre communicates the results of more careful and elaborate work, in which he points out the characters of distinction between India and Alexandria senna as revealed under the microscopic lens. The present paper is illustrated by a series of five photomicrographs, which must be consulted along with the original text. In his former paper, the author had laid some stress on the dissimilarity of the epidermal cells in the two kinds of senna. His present results eliminate these from further consideration as a means of distinction. The statements made by Schneider concerning the number and size of the neighbor-cells (*nebenzellen*) is likewise misleading, and is easily disproved by consulting the photomicrographs. Prof. Sayre found in thirty cases that the stomata of Alexandria senna showed sixteen with two and fourteen with three neighbor-cells, while forty stomata on the epidermis of India senna exhibited twenty-two

FIG. 57.

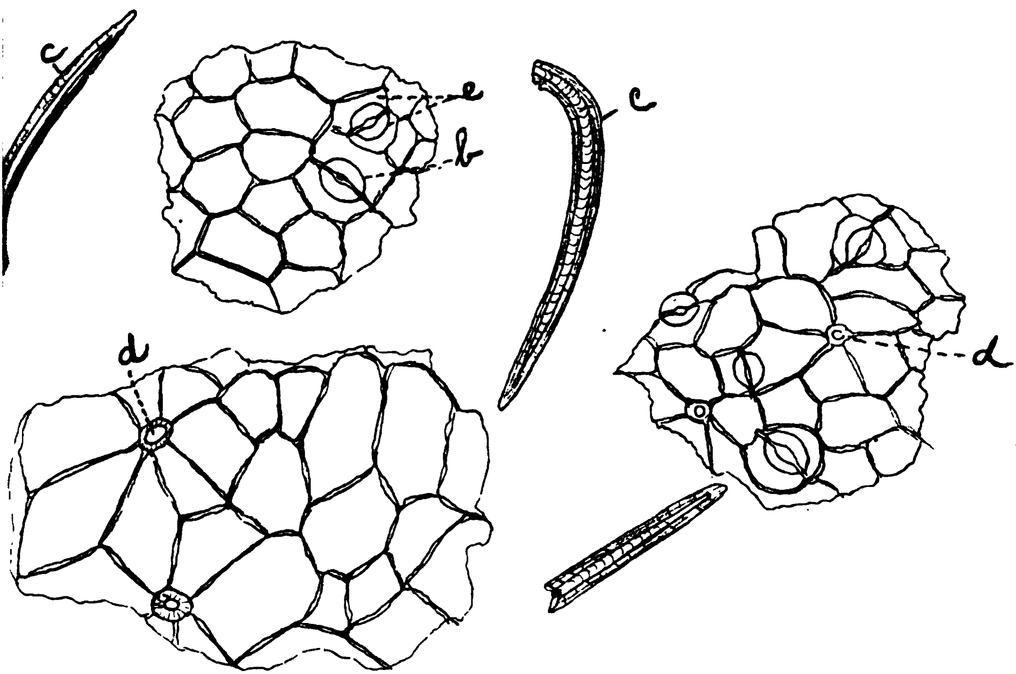


with two, fifteen with three, and three with four neighbor-cells. On the other hand, more value can be expected from the difference in the size and shape of the stomata of the two sennas. The stomata of the Alexandria senna are smaller and much rounder than those of the India, and while occasionally stomata of a rounded form may be found in the India senna, the stomata are as a rule elongated, oval and larger, while the occa-

sional rounded forms are also larger and do not look like the rounded stomata of Alexandria senna.

At the present state of the investigation, this character represents by far the most characteristic difference between the two species and, together with the number of hairs, affords the best means of detecting a mixture of the two in powdered form. The distinctions in the two sennas in No. 60 powder, as revealed by the microscope, are shown by the accompanying cuts (Figs. 58 and 59). To carry out the examination, take a portion of the No. 60 powder, place it in a small homeopathic vial, and add to it twice its volume of a mixture of water and glycerin in equal parts. Thoroughly

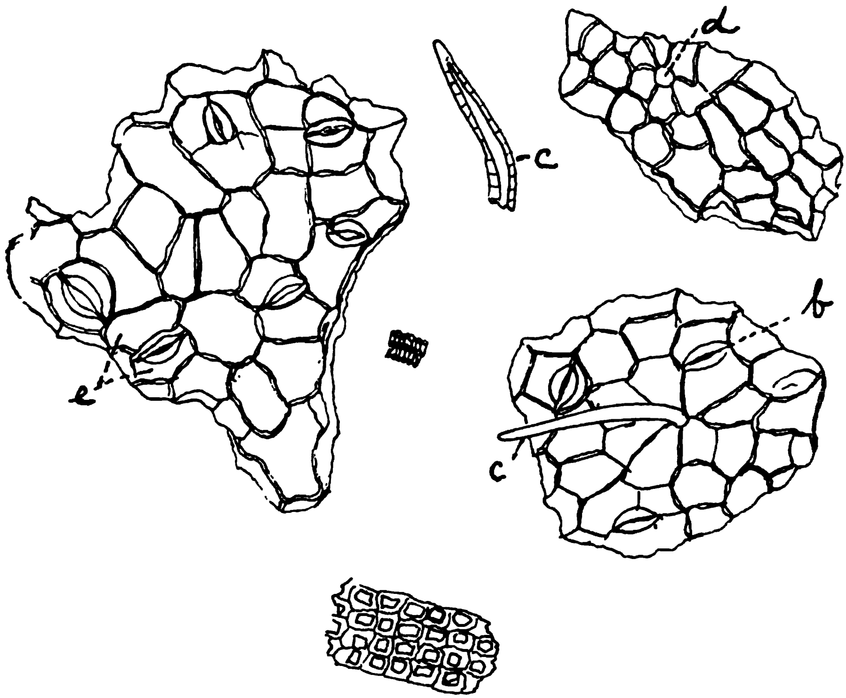
FIG. 58.



shake this mixture, and while still turbid with the suspended powder, place a drop on each of several glass slips and cover with cover glasses. If air bubbles or too great opacity exist, heat to boiling over an alcohol lamp. Search for hairs showing the tips present, and if they appear abundant—one to four in each field of a ¼-inch objective—Alexandria senna is present. To confirm, examine several fragments of the normal epidermis for stomata. If many are found that are quite round in outline, the presence of Alexandria senna is assured. In further confirmation examine the number of hair scars upon the epidermal fragments; these thould be found

frequently at a distance of two to five epidermal cells apart. A sample of India senna, on the contrary, will exhibit few hairs, often none in the field,

FIG. 59.



and a great majority of the stomata will be of the elongated oval form. The hair scars should not frequently be closer than five epidermal cells apart.—Amer. Jour. Pharm., June, 1897, 298–307.

Senna — Differential Characteristics of the Alexandria and India Varieties.—Albert Schneider contributes a microscopic study of Alexandria and India senna, accompanied by cuts showing the characteristics of the two sorts, as well as some adulterants. He sums up his conclusions as follows: (1) Both sennas have hair cells and stomata on the upper as well as lower epidermis; somewhat more numerous on the lower surface. Both contain prismatic crystals and small quantities of starch. (2) In both sennas the outer cuticle appears irregularly ridged or rugose, due to the linear thickening of the cuticle. The cuticle and outer walls of the epidermal cells are not greatly thickened. (3) The hair cells of both sennas are single-celled, quite thick-walled, and appear warty, due to an uneven thickening of the membrane; the larger hair cells are curved at the base. (4) The hair cells of A. senna are more numerous (the ratio 10:1 of Sayre is perhaps too high; 8:1 is more nearly correct), and they

are generally larger and curved sabre-like. In I. senna they are usually smaller and less frequently curved, though they are by no means generally straight. (5) In A. senna each hair cell is bounded by from four to six epidermal cells, usually five. In I. senna each hair cell is bounded by from five to seven epidermal cells, usually six; furthermore in I. senna, these boundary epidermal cells are somewhat elongated radially, more so than in A. senna. (6) The epidermal cells of A. senna are somewhat smaller than those of I. senna. This is in direct contradiction of the conclusions of Sayre, whose statement is probably due to a mistake—typographical or otherwise. (7) The stomata of A. senna usually have from three to five "nebenzellen" (the German term for the epidermal cells bounding the guard cells). If only two are present they are generally of nearly equal size. The stomata of I. senna usually have two "nebenzellen," one of which is much larger than the other; but even the larger one is, as a rule, smaller than a typical epidermal cell. The author briefly describes the manipulation necessary for distinguishing the two sennas under the microscope, as well as for the recognition of their adulterants, the latter being here named in the order of their frequency: *Solenostemma Argel*, Hayne; *Coriaria myrtifolia*, L.; *Globularia alyssum*, L.; *Colutea arborescens*, L.; *Pistacia lentiscus*, L., and *Tephrosia apollinea*, D. C. With the exception of the last named, the microscopic characteristics of these adulterants, and of the two varieties of senna, are shown in the illustrations accompanying the author's paper, to which reference may be had in Amer. Drug., April 10, 1897, 195–196.

Cassia abusus, L.—Use of the Seeds in Eye Troubles.—Prof. Hartwich calls attention to seeds of *Cassia abusus*, L., a plant abounding in India and extending as far west as Central Africa. These seeds, which are known by the names

Cheshmat, Chashmizok, Schischen, etc., have been used since ancient times, especially in the treatment of eye troubles, in a manner similar to that in which the well known jequirity seeds or paternoster peas from *Abrus precatorius* are used. They are used alone as a fine powder, or with alum, sugar, lemon juice or lard, or in an infusion. They are said to be especially effective in the Egyptian eye trouble. According to B. Schuchardt, their action is manifested most plainly in the limiting and removing of redness, looseness (Auflockerung) and granulation of the conjunctiva in blenorrhœa.—Pharm. Rev., October 1896, 232; from Gehe's Bericht., Sept. 1896.

Acacia—Species Yielding Gum Arabic.—Dr. Schweinfurth has presented to the Museum of the Pharmaceutical Society, specimens of four species of *Acacia*, to which E. M. Holmes calls attention in order to point out that as the quality of gum brought into the market varies exceedingly in its solubility, the viscosity of its mucilage and its color, it would be worth

while to try and cultivate the best kind, viz., *Acacia Senegal*, in Australia, or other suitable colonies.

1. *Acacia Senegal, Willd.*—This tree is said to yield the fine white gum of Kordofan. It extends from Nubia to Senegal. In West Africa it is known as "verek," and in East Africa as "hashab."

2. *Acacia Séyal, DeC.*—This tree, in common with *A. stenocarpa*, Hochst, is called "taleh," and according to Schweinfurth yields the principal part of the brownish gum of the Soudan. In this country the gum is known as "talea" gum.

3. *Acacia Séyal, DeC., var. multijuga.*—This tree also yields gum, but not when it grows south of 10° N. Lat.

4. *Acacia Fistula, Schw.*—The tree grows abundantly in the district of Gedaref, in Southern Nubia, and in the province of Sennaar. The native name of the tree is "ssoffar," literally the whistling tree, on account of the wind causing a flute-like sound when the tree is moved by it, owing to the bulbous bases of its thorns being perforated by an insect. The gum is known as Gedaref gum. It probably yields some of the gum known in this country as Sennaar gum.—Pharm. Journ., Dec. 12, 1896, 509.

Acacia Arabica—Tannin Value of the Bark.—Prof. Hartwich calls attention to the large percentage of tannin—22 to 31 per cent.—in the bark of *Acacia Arabica*, Willd. Like many drugs containing tannin, the bark is used as an astringent tonic.—Pharm. Rev., Oct., 1896, 231; from Gehe's Bericht, Sept., 1896.

Acacia—Reducing Action on Fehling's Solution, Commercial Quality, etc.—J. Henry Schroeder, in view of the repeated statements that commercial powdered acacia is frequently adulterated with dextrin, has examined twelve samples of powdered gum purchased in different states, and one of granulated gum, and compared the results with the requirements of the U. S. P. His results, which are given in a table, indicate that the cheaper grades of gum are most frequently employed in the preparation of the powdered article, but that adulteration with dextrin is not generally practiced. Incidentally he observed that these samples all produced a marked reduction when subjected to the alkaline cupric tartrate test. He, therefore, repeated the experiment with pure Senegal gum in tears, and found that when the heating was prolonged during twenty minutes, a well-defined reduction was produced, though not as prominent as when an equal amount of the powdered substances was used. A like behavior has already been noticed by Hager, Hartwich and Fischer. The author expresses the opinion that the difference in the behavior of the gum in tears and of the gum in powder is due to the drying, to which the latter is subjected before powdering.—Amer. Jour. Pharm., April, 1897, 195–199.

Licorice Root—Commercial Sources.—H. N. Rittenhouse has contributed a paper on the commercial sources of licorice root, from which it

appears that while prior to 1870 the supplies for the United States were principally obtained from Spain, since then—the consumption having increased very largely—other countries are now being drawn upon. These countries are Southern Russia, Asia Minor (chiefly Anatolia) and Syria, the largest source of supply being from Russia. The latter excels in yield of glycyrrhizin and extractive, but is more acrid than is the Spanish, which is the sweetest, or the Australian, which is intermediate between the two. While the Spanish root is still in popular demand, owing to the drain upon the supply it is so closely and skilfully sorted and packed that much of it consists of fine, immature, fibrous roots, which, while they may be called licorice root, are practically worthless for the purposes for which licorice is used. "Selected" licorice root, put up in small bundles, was formerly selected from Spanish sources, but now consists of root from any and all sources if of proper quality—straight and round—and of the requisite length and thickness. There is no reason why peeled Russian root may not now be prepared in Russia; it was formerly prepared in Syria. Any "peeled" variety might be as good if prepared with proper care.—Amer. Jour. Pharm., Jan., 1897, 13–15.

Robinia Nicon—Active Constituent.—E. Geoffrey has determined the active constituent of *Robinia Nicon*, a plant used in French Guiana as a fish poison, to be a neutral crystalline substance, not a glucoside, which he has named

Niconline. It has the composition C_8H_4O, melting point 162°, dissolves in alkaline solutions, and is precipitated from them unaltered. It is only slightly soluble in water, but is soluble in threet imes its weight of benzene, and in less than its own weight of chloroform. Its physiological action shows that it is an excitant of the spinal cord, of which it exaggerates the reflex action. Death appears to result from paralysis of the respiratory centers.—Pharm. Journ., Oct. 3, 1896, 292; from Annales de l'Institut Coloniale de Marseille.

Copaiba—Insufficiency of the Ammonia Test of the German Pharmacopœia (supplement to D. A. B.).—Dr. E. Bosetti reports that the ammonia test given in the supplement to the D. A. B. is not sufficiently sensitive, since it admits of the presence of from 30 to 35 per cent. of colophonium in both the Maracaibo and Para sorts of copaiba. The requirement that thick-liquid sorts of copaiba are to be given preference, further encourages this kind of adulterations; while the ammonia test applied to the residual resin, after the removal of the volatile oil by evaporation, is of no value. As a matter of fact, the Maracaibo balsam of commerce, designated as responding to the ammonia and pharmacopœial tests, is adulterated in many instances with from 5 to 25 per cent. of resin. The author proposes to use this insufficiency of the ammonia test, however, to a good purpose, as follows: 7 p. of copaiba and 3 p. colophonium are melted together

over a moderate fire; the resultant mixture should respond to the ammonia test of the D. A. B. The colophonium, however, must be such as will be taken up by copaiba of known purity to the amount of 35 per cent. without being indicated as present by the ammonia test. This method of admixture with colophonium, furthermore, admits of being employed quantitatively to determine the amount of fraudulently added resin.—Zeitschr. Oest. Ap. Ver., Oct. 10, 1896, 767.

Copaiba—Poisonous Effect.—Dr. Thompson reports a severe case of copaiba rash following the use of capsules, containing ten minims of copaiba oil, given thrice daily. On discontinuing the use of the capsules the eruption, which resembled measles and covered the face, neck, chest, abdomen, and lower extremities, gradually disappeared, though traces remained in the thighs for seven days.—Brit. Med. Journ., No. 2, 1897, 522.

Balsam of Tolu—Examination of a Spurious Sample.—J. Oldham Braithwaite has examined a spurious specimen of balsam of tolu which has recently found its way into the London market. It has a soft consistence, is very sticky, especially when chewed, and shows only an occasional crystal when examined by the microscope, either in its normal condition or after hardening by exposure on the water bath. It was noticed that during this heating, and more markedly at a higher temperature, the resinous portion assumed a much darker red color than genuine balsam similarly treated. Extracted with successive quantities of boiling water it yielded 1.15 per cent. of crystalline acid on cooling. This acid was fractionally crystallized from boiling water, each fraction melting sharply at 133° C., and consisting wholly of cinnamic acid. A sample of genuine balsam similarly extracted with boiling water gave 4.2 per cent. of cinnamic acid. On distilling a portion of the balsam with water, the odor of the distillate was not markedly different from that of tolu, but contained distinctly more of a fragrant volatile oil and less cinnamic acid. Treated with carbon disulphide, 61.4 per cent. was soluble. On evaporating the solvent, this portion was left as a fragrant brown, transparent, viscid mass. Its total acid number when saponified with alcoholic potash was 278.

Genuine balsam of tolu when extracted with carbon disulphide leaves a perfectly crystalline white residue, consisting almost entirely of cinnamic acid, and giving a total acid number which does not fall below 300. Further experiments have, however, thrown no light on the nature of the substitution in the spurious sample.—Pharm. Journ., April 10, 1897, 307.

Physostigma venenosum—Botanical Description, History and Chemistry, etc., of the Seed.—Prof. J. U. Lloyd, in a paper accompanied by a handsome illustration showing a flowering branch of *Physostigma venenosum*, together with various important organs of the plant, gives a historical sketch of the Calabar bean, a description of its chemical constituents and of its medicinal and toxic properties, together with a bibliography embracing

thirty-two references to papers from which he obtained his information. See Western Drugg., June, 1897, 249–251.

Indigo—Cultivation and Preparation in Mexico.—In his admirable report on the "Productions of Mexico," Sir Henry Doring gives an interesting description of the cultivation aad method of preparing indigo in Mexico. It is produced in Chiapas, Colima, Guerrero, Jalisco, Michoacan and Oaxaca, three plants being cultivated, namely, *Indigofera tinctoria, I. disperma, I. ānil.* The spring is the best time for sowing, and in the months of September and October the plants begin to flower, but in order to save the indigo in them, especially in the leaves, the plants are cut as soon as the yellow leaves appear on them, or the little buds begin to bloom. While the substances producing the indigo reside in the leaves, the whole plant is subjected to the process of fermentation and agitation, by which the dye is manufactured. The author describes this process fully, but it apparently does not differ in essentials from well-known and described processes.—Pharm. Journ., Sept. 26, 1896, 278; from Journ. Soc. Arts.

Gleditschia Triacanthos—Proximate Analysis of the Bark.—Louis T. Carstens has subjected the bark of the honey locust to proximate examination. Two important constituents were an organic acid and an alkaloid, the latter being crystalline. The petroleum extract (fat, wax, etc.), amounted to 1.38 per cent.; the ether extract (resin, 1.15 per cent., organic acid, etc.), to 1.17 per cent.; the absolute alcohol extract (resin, 0.97 per cent., alkaloid, etc.), to 1.62 per cent.; the water extract (glucose, 0.63 per cent., saccharose, 0.57 per cent., mucilage, 2.08 per cent., dextrin, 1.92 per cent., etc.), to 6.51 per cent.; the alkaline water extract (pectin and albuminoids, 4.84 per cent., etc.), to 13.68 per cent.; and the acidulated water extract contained: Parabin, etc., 3.62 per cent. The other constituents were: Lignin, 11.76 per cent.; cellulose, 42.42 per cent.; moisture, 5.10 per cent.; ash, 7.00 per cent.; undetermined and loss, 5.74 per cent. The organic acid was not obtained in crystalline condition. The alkaloid afforded precipitates with Mayer's solution, gold chloride, phospho-tungstic acid, picric acid, platinic chloride, and tannic acid, but not with potassium tri-iodide. It was colored dark-red by sulphuric acid, brownish-red by sulphuric and nitric acids, dark-brown by sulphuric acid and potassium dichromate, brownish-red by nitric acid, and brown by gold chloride.—Amer. Jour. Pharm., Jan. 1897, 40–41.

Ononis spinosa, L.—Constituents of the Root.—In 1842 H. Reinsch obtained from the roots of Ononis spinosa, L., the glucoside ononin. This glucoside is accompanied by a wax-like impurity which was subsequently obtained in a pure condition by Hlasiwetz, and named by him

Onocerin. H. Thoms now records the results of his studies and experiments concerning this substance. He finds it to be a di-secondary alcohol of the formula $C_{26}H_{42}(OH)_2$, melting at 232°. It is with difficulty

soluble in cold alcohol, acetic ether, acetone, ether, chloroform and benzene, but more readily in toluene and particularly in amyl-alcohol and oil of turpentine. Nevertheless it is crystallized best from hot solutions in alcohol or in acetic ether, in which it is sparingly soluble. Being an alcohol, as is shown by its di-acetyl and di-benzoyl derivatives, the name onocerin, given by Hlasiwetz, should be changed to

Onocol. By oxidation it yields a well-crystallized diketone, *Onoketone* ($C_{26}H_{40}O_2$); while upon further oxidation butyric and acetic acid, an acid of composition $C_{20}H_{38}O_2$, and a monobasic resin acid of composition $C_{20}H_{30}O_5$. It seems probable, however, that these acid products of oxidation are not the only ones obtainable, but that, dependent upon the method of the experiment, a series of other acids may be obtained. Scarcity of material prevented further experiments in this direction.—Arch. d. Pharm., 235 (Jan. 1897), 28–39.

Lathyrus sativus—Poisonous Properties of the Seeds.—R. S. McDougall has collected a number of facts concerning the poisonous properties of "pulse"—the seeds of *Lathyrus sativus*—and of some other leguminous plants. He states that the continued use of pulse by man as a daily article of food leads eventually to paralysis of the lower limbs, various instances of this being recorded in Scotland and in India. During the seventeenth and eighteenth centuries, the use of pulse was forbidden as an article of food in Germany and in France. Its effects upon animals seems to be equally injurious.—Pharm. Journ., April 3, 1897, 290; from Trans. Bot. Soc., Edinburgh, xx., 301.

Tephrosia macropoda—Poisonous Characters of the Root.—Dr. Plugge has examined a root, used as a fish-poison, which was said to have caused the death of a Zulu on drinking a decoction of it, and which has been identified to be the root of *Tephrosia macropoda.* He finds the active principle to be a heart poison, but that it is not an alkaloid nor that it is identical with cytisin, the poisonous principle already detected in many leguminous poisonous plants.

Butea frondosa, Roxb.—Description and Use of the Seeds.—Both the seeds and the kino (Bengal kino) produced from *Butea frondosa,* were among the East Indian drugs recently exhibited at Dresden. Prof. Hartwich observes that the seeds are found singly in the point of the leathery pod. This pod is flat at the bottom, wing-shaped, and indehiscent. The seeds are flat, reddish-brown, becoming 4½ Cm. long, 3 Cm. wide, kidney-shaped, or ovate, somewhat wrinkled. The raphe runs from the hilum, located on the concave side, half way around the seed, and disperses in branches in the leathery seed coating. The seeds are reputed in India to be a good anthelmintic. The decoction of two or three seeds is regarded as a sufficient dose. They are also used in herpes, and with astringents and rock salt for cloudiness of the cornea. They contain 18.2 per cent. fat.—Pharm. Rev., Oct. 1896, 232; from Gehe's Bericht, Sept. 1896.

Clover—Curious Ailment of Horses Produced by the Crimson Flowers.—In Circular No. 8, Division of Botany, Department of Agriculture, a rather curious ailment in horses, occasioned by eating too mature crimson clover, is reported. The barbed hairs of the mature calyx, by the action of the stomach, become matted together into the form of felt-like balls, which set up in the stomach and intestine where they form and lodge violent and fatal troubles. As many as thirty such concretions have been found in the stomach of a single horse, and in size they may reach four inches. They are, of course, very light, a specimen four inches in diameter weighing less than five ounces. When once formed they act as obstructions in the alimentary tract, and no remedy is suggested. By feeding the plant before these hairs become hard and stiff, no danger need arise from the use of the plant.—Pharm. Rev., Oct. 1896, 236.

TEREBINTHACEÆ.

Myrrh—Trees Yielding the Commercial Gum-Resin.—E. M. Holmes observes that writers on Materia Medica distinguish four varieties of myrrh, *viz.*: Somali myrrh, two forms of Arabian myrrh and Yemen myrrh. One of the Arabian myrrhs is that described in "Pharmacographia," and is designated as "Arabian myrrh of Hanbury;" the other is described as "Arabian myrrh of Dymock," or "Meetiya," an article imported into Bombay from Aden and Makula, and said by Dr. Dymock to be mostly sold in India as true myrrh. It differs entirely from the Arabian myrrh described by Hanbury. Mr Holmes gives a brief description of these varieties of myrrh, their botanical source, etc.; but the principal object of his paper is to throw some light, if possible, upon a controversy occasioned by the recent statement of Professor Schweinfurth, that Arabian myrrh is the product of *Commiphora Abyssinica*, Engl., and of *C. Schimperi*, from which view the Director of the Kew Gardens differs, expressing the opinion that Fadhli myrrh, the Arabian myrrh of Hanbury, may be yielded by both *C. Myrrha* and *C. simplicifolia*, the latter species also being accepted by him as the source of Yemen myrrh.

Prof. Schweinfurth having supplied the museum of the Pharmaceutical Society with specimens of the bark, fruit, leaves, etc., of a number of different species of *Commiphora*, it occurred to Mr. Holmes that some light might be thrown upon the question in controversy by tasting the bark and fruits of these and other specimens, especially as true myrrh has a very bitter taste and peculiar aroma, hardly likely to be absent in the plant itself. His results are given as follows:

1. *Commiphora Abyssinica* (No. 1700, Schweinfurth).—Erythræa. Neither fruit, bark, nor leaves have any bitterness or aroma.

2. *C. Schimperi* (No. 1310 a, Schweinfurth), Erythræa.—The fruit has a turpentiny flavor, less marked in the bark, but neither have the bitterness nor the aromatic taste of myrrh.

quantities in Sicily and is thence exported to England and France. A good quality of shinia leaves is also consumed at Lyons as a dyeing material for silk stuffs. The crop is gathered during the months of April to September, the leafy branches of the shrub being cut off, laid in heaps on the ground, and left to dry. This takes place generally in four or five days, during which the heaps are left undisturbed, in order that as few leaves as possible should come in direct contact with the sun, which bleaches and overdries them and thus depreciates their value. The leaves, beaten off from the branches with flails, are exported in sacks.—Journ. Imp. Inst., *3*, 155.

PIPERACEÆ.

Kava-Kava—Chemical Composition.—Arthur Bossingham communicates the results of a chemical examination of kava-kava. Besides the crystalline body, methysticin, which has been already described by others, he was enabled to isolate and identify three resins, one soluble in 5 per cent. solution of potassium carbonate, the second insoluble in this, but soluble in 5 per cent. solution of caustic potassa, while the third was insoluble in both of these alkaline solvents. The ash amounted to 2.495 per cent. of the air-dried root, and contained, besides mere traces of iron and manganese, mainly calcium, sodium and potassium.—Proc. Wisc. Pharm. Assoc., 1896, 53–55.

RHAMNACEÆ.

Frangula and Cascara Barks—Characters of Distinction in their Powdered Condition.—L. E. Sayre contributes a paper in which he gives a description, with illustrations, of the microscopic structure of the barks of *Rhamnus Frangula*, *R. Purshiana* and *R. Californica.* The object of the author's investigation was to determine if possible a microscopic method of distinguishing these barks in a state of powder. This is comparatively easy between the bark of *R. Frangula* on the one hand, and the barks of *R. Purshiana* and *R. Californica* on the other, since the frangula bark contains no stone cells, while the other two contain a large number of them, which are very easily noted by one at all familiar with vegetable tissues. It is not so easy, however, to distinguish microscopically between *R. Purshiana* and *R. Californica* bark powders; but here it is possible to distinguish the one from the other by the difference in color assumed by the two powders when they are moistened with an alkaline solution. In *R. Purshiana* an orange color is developed, whilst in the case of *R. Californica* a deep red color is produced. The test is applied by adding 0.2 Gm. of the powder to 2 Cc. of T. S. potassium hydrate.

As a further result of his studies of the microscopical characters of these barks, the author suggests the following additions to the pharmacopœial description of the two official barks. To

Rhamnus Frangula add: Medullary rays not converging at the outer

ends (distinction from *Rhamnus Purshiana*). Stone cells absent (distinction from *Rhamnus Purshiana* and *Rhamnus Californica*). To the description of

Rhamnus Purshiana add: Medullary rays in groups converging at their outer ends (distinction from *Rhamnus Californica*). Stone cells present (distinction from *Rhamnus Frangula*).—Amer. Jour. Phar., Mar. 1897, 126–134.

CELASTRACEÆ.

Celastrus paniculatus, Willd.—Medicinal Use of the Seed, etc.—Prof. Hartwich calls attention to the seeds of *Celastrus paniculatus*, Willd., a plant which occurs in the East Indies, extending eastward over the Sunda Islands as far as the Philippines. It is called in India: *Malkanguni, Gundumeda, Valuluvai* and *Ati-panch-cham.* The seeds are said to be a stimulating remedy. They are used as an aphrodisiac, also in rheum, gout, apoplexy, leprosy, etc. Often, instead of the whole seed, the fatty oil prepared from them, present to about 30 per cent., is used. It is of a red color, due to the arillus enclosing the seed, and has a bitter taste. Mixed with benzoin, cloves, nutmegs and mace, an empyreumatic oil is obtained by dry distillation, which is used medicinally.—Pharm. Rev., October, 1896, 232; from Gehe's Bericht., Sept. 1896.

AQUIFOLIACEÆ.

Maté Plants—South American Varieties.—Dr. Th. Loesener has given careful study to the Maté plants of South America, and brings out many interesting facts. Maté is understood to mean a tea-like drink, which is prepared by the natives and also by the European settlers in Paraguay, Argentine and Brazil, especially from the leaves and young twigs of *Ilex Paraguayensis*, St. Hil. Originally the word was used to designate the vessel in which the beverage was prepared, a hollowed-out gourd, but it has been carried over to the tea itself. The species mentioned, although the principal plant used, is not the only one. *Ilex amara* (Vell.), Loes., *I. affinis*, Gardn., *I. theezans*, Mart., *I. cuyabensis*, Reiss., *I. dumosa*, Reiss., *I. diuretica*, Mart., *I. conocarpa*, Reiss., *I. pseudothea*, Reiss., *I. Glazioviana*, Loes., *I. congonhinha*, Loes., as well as *Villarezia Congonha* (D. C.), Miers., from the family *Ilicineæ* and *Symplocos* species are used for this purpose. The author, however, in the samples examined, found but three species, *I. Paraguayensis*, *I. amara* and *I. dumosa*. In addition to the systematic and anatomical study of the plants concerned, many facts of more general interest find mention. Enormous quantities are exported from the centers of production to the neighboring states. In 1870–71, Brazil exported 9½ million kilograms; in 1869, the Brazilian province Paraná alone exported 12 million kilos. The importing countries are Chili, Bolivia and Peru, the export to Europe being very small. In 1878 it was estimated that the total consumption of Maté per year in South America reached the

sum of 100 million kilos. This is equal to 9 kilos per capita or 200 liters of Maté. The preparation of this beverage by the native Indians was already important before the European immigration, and the herb was one of the important articles of trade among the natives. Extensive cultivation of the Maté plants existed in the years 1609–1769, at the time of the Jesuit rule at the Missions between Uruguay and Paraná.

The caffeine-content varies according to condition and treatment of the leaves. Fresh, unroasted, dried leaves contained 1.675 per cent., while the dried leaves of commerce contained but 0.55 per cent. The altitude of the region in which the plant grows, the time of year and the care used in preparation all influence the content. The tea stimulates without exciting, stills the thirst, and is also said to be nutritious. The drink is made by pouring boiling water on the prepared leaves. The first decoction is usually too strong, and is thrown away. The succeeding draughts are preferred. The same leaves are used two or three times by adding a few fresh leaves each time, or by boiling the leaves two or three times for as many minutes. The endeavor to introduce this beverage in Europe has met with no success, although Europeans immigrating to South America take kindly to it.—Pharm. Rev., Dec., 1896, 278; from Ber. d. Deutsch. Pharm. Gesellsch., *6*, 203.

Zanzibar Copal—Investigation of Constituents.—A. Stephan has subjected Zanzibar copal to chemical investigation, with the following results: When finely powdered it melts at about 140° C.; it is slowly but completely soluble in alcohol; benzene, chloroform and glacial acetic acid dissolve about 30 per cent., ether about 34 per cent., petroleum spirit and carbon disulphide about 10 per cent. When boiled with alcohol the resin caked, and only a slight proportion dissolved, but by repeated digestion with alcohol it could be brought entirely into solution and precipitated with water. The resin thus purified was more soluble in the menstrua previously mentioned, and dissolved also in boiling very dilute solution of potash (0.1 per cent.). All attempts to separate it into other constituents were unsuccessful, nor could it be saponified. It appeared to consist of resin-acids, the principal of which, constituting about 80 per cent. of the resin, was called trachylolic acid. This acid could be obtained with difficulty in minute sphæro-crystalline masses melting at 168° C. From it the potassium, copper and iron salts were prepared. A second acid, present to the extent of about 4 per cent. only, was also obtained; to this the name isotrachylolic acid was assigned. These two acids, together with about 6 per cent. of α-copal resin and β-copal resin, a bitter principle and volatile oil, form the constituents of Zanzibar copal as far as the author could succeed in separating them.

The author was induced to select Zanzibar copal for his investigation, because its purity and hardness render it the most valuable variety, and he emphasizes the source because many statements are met with without any

mention of the variety of copal to which they refer. Other East African varieties are Mozambique and Madagascar copal. All of these, together with the copal from West Africa and the Kauri copal of New Zealand, are fossil resins derived from various plants originally; while Manilla copal and South American copal are collected from the plants yielding them.—Pharm. Journ., Dec. 19, 1896, 525; from the Author's Inaugural Dissertation.

EUPHORBIACEÆ.

Cassava—Cultivation in Jamaica.—The cultivation of cassava for a food-stuff in time of dearth has been occupying the attention of the Agricultural Society of Jamaica. The plant is cultivated at a nominal cost, and is said to be one of the most productive in the world, an acre of cassava yielding more nutritive material than six acres of wheat. The cultivation entails but little labor and may be undertaken by women and children; for, except in the early stages of growth, the plant is almost independent of moisture and scarcely requires attention. Even under the present crude conditions, a cassava patch yields an abundant harvest, which may, doubtless, be greatly increased by systematic cultivation.—Journ. Imp. Ind., *3*, 155.

Cassava—Percentages of Hydrocyanic Acid in the Sweet and Bitter Variety.—Dr. W. H. Ince, Acting Government Analyst at Trinidad, has recently found in a sample of sweet cassava 0.01017 per cent. of hydrocyanic acid. The results of E. Francis, in 1877, show the sweet variety to contain from 0.0113 to 0.0238 per cent., and the bitter variety from 0.0134 to 0.0442 per cent.—the average being 0.0168 and 0.0275 per cent. respectively. It is well known that either variety loses its poisonous activity, and becomes a valuable food, by previous drying in the sun or artificially.—Pharm. Journ., Aug. 22, 1896, 169.

Ricinus Communis.—Preparation and characters of poisonous principle of the seeds, *Ricinine*, which see under "Organic Chemistry."

Kamala—Unsatisfactory Quality of the Present Supply.—Prof. E. L. Patch observes that he has of late been unable to procure any kamala meeting the official requirement respecting the ash, which is limited by the U. S. P. to 8 per cent. All samples obtainable yielded from 43 to 50 per cent. of ash that consisted largely of sand.—Merck's Report, Aug. 15, 1896, 403.

Kowli Seeds—Confusion as to Source.—Prof. Hartwich has examined some seeds, exhibited at Dresden under the name of "Kowli seeds," and expresses the opinion that they are not derived from *Croton oblongifolium*, Roxb.,—the source given by Flückiger and Hanbury for the seeds which under the name of *kuli* are used in India as a substitute for the seeds of *Croton Tiglium*, L.,—but that they correspond well with the description given in Prodomus of the seeds of *Croton oblongifolium*, Tharactes

(= *C. persimilis*, Müll. Arg.), and that it is not impossible that a confusion of the two species has been made. This might easily occur by reason of the present popular disregard in pharmaceutical and pharmacological books of the authors' names and the plant names. The seeds reach a length of two and one-tenth Cm., a breadth of one and two-tenths Cm., a thickness of eight-tenths Cm., ovate, having pointed ends with a marked caruncle. The outer side shows the grayish brown crusty seed-coat with irregular rough longitudinal stripes; the cross-section shows a large endosperm, in the middle the embryo of considerable size with flat cotyledons. Beside the fatty oil and protoplasm, the cells of the endosperm show longitudinally very large aleurone grains, which contain a considerable number of small globoids and badly formed crystalloids.—Pharm. Rev., Oct. 1896, 233; from Gehe's Bericht, Sept. 1896.

URTICACEÆ.

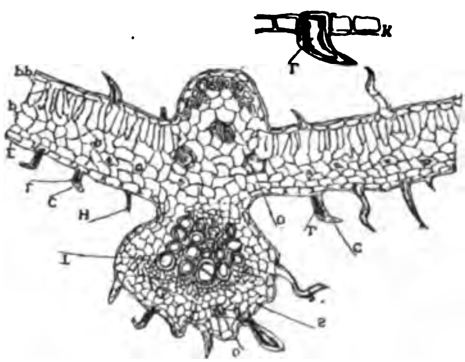
Indian Hemp—A Rare Egyptian Product.—E. Lepinois calls attention to a preparation of Indian hemp from Egypt that is seldom met with in commerce. It consists of somewhat elongated masses, which may be smooth and fusiform or thicker and more or less furrowed transversely. These furrows indicate plainly that the mass when fresh is somewhat waxy and is moulded into shape in the hand. The color is brown with a greenish tinge. The odor is not marked, but when fresh recalls that of calamus. It is only when heated that it gives the odor of Indian hemp. The masses weigh from 10 to 40 grams, and have an average density of 1.338. The easily powdered mass, when examined microscopically, is found to consist of hairs imbedded in an amorphous yellowish or brown mass made up of glandular trichomes filled with resin. These hairs, sometimes entire, sometimes broken, have the structure characteristic of the *Cannabinaceæ*. They are unicellular and covered externally with small mammilose papillæ. They enclose near the base a resinous material similar to that which is distributed throughout the mass. At first sight the drug might be confounded with Ladanum, but the form of the hairs contained is decisive. Those of the *Cistaceæ* are multicellular and bear a gland at their extremity. A chemical examination showed the presence of a resin, brittle, with pronounced odor, but lacking characteristic taste. It is completely soluble in alcohol, ether and carbon disulphide, insoluble in potash, soda and ammonia. It is little acted upon in the cold by acids. The residue remaining after extraction with water and alcohol is composed in part of trichomes and in part of insoluble minerals. On incineration, the carbonate and sulphate of calcium, peroxide of iron and silica were obtained. The results of the examinations were as follows:

Aqueous extract	10.80	per cent.
Alcoholic extract	32.00	"
Insoluble organic matter	33.20	"
Ash	24.00	"

Egypt is not the geographic source of this drug; there the cultivation and importation of Indian hemp is forbidden by law. It is, however, smuggled in and sold by Armenians. In Syria the drug is cultivated and the resin prepared. Probably the specimens examined were from Syria; it resembles in aspect the product made in different points in Galilee and Asia Minor, and called "chirros," a name closely resembling "churrus," employed in India for the resin of the Indian hemp. (See Proceedings, 1896, 642). The "chirros" is a kind of confectionery to which hashish is added. Although the form of this preparation is here found, no saccharine substance is present.—Pharm. Rev., Sept. 1896, 208; from Rep. d. Pharm., 1896, 241.

Cannabis Indica—Histology of the Leaf.—Alfred R. L. Dohme, after referring to the products that are obtained from the East Indian *Cannabis sativa*, gives a histological description of the leaf, illustrated by a drawing showing a cross-section (see Fig. 60) magnified 120 diameters, together with one of the cystoliths of the leaf, which abound on the under side thereof and are in a measure characteristic. The general structure of the

FIG. 60.



leaf is a trifle abnormal, although similar to the leaf of Datura Stramonium or Piper angustifolium. The parenchyma P and palisade parenchyma P P are both normal, and the ducts, both tracheotic and sieve, are rather centrally located and the former rather thickened and quite ligneous. Scattered through the parenchyma are cells (see O) that secrete a dark-green resin which disappears if the section is treated with alcohol before mounting. The ordinary hairs or trichomes (see H) generally do not terminate in a cell of the parenchyma below the epidermis, but grow direct from the latter. The cystoliths (see C), however, always terminate in a cell of the parenchyma below the epidermis. The under side of the leaf is richest in these cystoliths, and one can convince himself of this by touching this side of the leaf, when he will experience a sticky and prick-

ing sensation due to their presence. They sometimes grow to a very large size and can readily be observed macroscopically. They contain in their interior a nodule of calcium carbonate (see L) and besides this secrete a mucilaginous substance. They are generally pointed and protrude at an angle from the epidermis.—Drug. Circ., Nov., 1896, 275.

Antiaris toxicaria—Examination of the Milky Juice.—H. Kiliani has subjected the milky juice of the upas-tree (*Antiaris toxicaria*) to chemical examination, with the results summarized below. The samples examined were collected by Hrolf Vaughan Stevens from ten large antiaris trees, and consisted of three parcels: one parcel (3.5 kilos) containing the original juice of the tree (labeled "*Ipooh Sap as from the tree*"), containing a little methyl alcohol as preservative; another (23 kilos) contained the concentrated juice, of the consistence of a salve; and the third parcel contained the resin which had separated from the juice dnring concentration. By methods which are given in detail, the author established in the milky juice the presence, besides an abundance of potassium nitrate, of a neutral crystalline principle, *antiarol*, of the glucoside *antiarin*, and of a *crystallizable resin.*

Antiarol crystallizes in long needles and quadratic or rhombic plates, melting at 146° C., and having a composition represented by the formula $C_9H_{12}O_4$. It is sparingly soluble in cold water, more soluble in boiling water, but readily soluble in alcohol. Ether dissolves it sparingly. Antiarol has not hitherto been observed. It is closely related to the *iretol* of de Laire and Tiemann, and when its aqueous solution is treated with chromic acid, dimethyloxyquinone ($C_8H_8O_4$), is produced with elimination of a methyl group. The glucoside

Antiarin, which is already known, is easily obtained by recrystallization from boiling water solution. It begins to melt at 220° C., is fully melted at 225° C., and has the composition represented by the formula $C_{27}H_{42}O_{10}+4H_2O$. By diluted acids it is split into *antiarigenin* ($C_{21}H_{30}O_5$), and *antiarose* ($C_6H_{12}O_5$); the composition of the sugar being inferred from that of *antiaric acid*, which forms a very crystallizable lactone. The crystallizable

Antiaria resin possesses few distinctive reactions, its composition probably conforming to the formula $C_{24}H_{36}O$.—Arch. d. Pharm., ccxxxiv., No. 6 (Aug. 3), 1896, 438–451.

Palo Panguy—An Astringent Drug from Chili.—Prof. C. Hartwich describes an astringent drug from Chili, which is used for tanning, and in the form of a decoction with a black-earth containing iron, for dyeing black. It is the thick root of

Gunnera chilensis, Lam., cut into disks, and reminding of rhubarb in its character; the discs being irregularly bent by the process of drying, up to 13 Cm. in diameter and 3 Cm. in thickness, and of a pale brown color. The drug contains about 9.34 per cent. of tannin, and finds medicinal application. The leaves of the plant are employed as cooling poultices

in fevers, while the thick leaf-stems, which have a sweetish-acid taste, are used similarly to those of the different species of *Rheum*, being eaten both raw and cooked. The microscopic examination of the root revealed the presence of oxalates and starch.—Zeitschr. Oest. Apoth. Ver., Sept. 1, 1896, 646–647.

CUPULIFERÆ.

Acorns—Percentage of Tannin.—Henry Trimble has determined the tannin in the several parts of chestnut-oak acorns collected at different periods, with the view to throwing some light on their astringent value. The portion of the fruit that is richest in tannin is the testa, which contained from 42 to 48 per cent., but the small amount of this coating in each acorn and the difficulty of separating it preclude the possibility of becoming a profitable source. The pericarp of the fruit contained nearly 16 per cent. of tannin, the cotyledons—composing the bulk of the fruit—only 8.75 per cent., while the cupules, collected in September, contained 19 per cent., but reduced to 13.37 per cent. in October after the fruit had lain in the ground upon which it was collected. A quantity of tannin extracted from the cupules and purified resembled in its physical and chemical characters and composition that of all the oak bark tannin heretofore examined. The cupules of six other species of *Quercus* were assayed with the following results: *Q. alba*, L., 11.75 per cent.; *Q. macrocarpa*, Michx., 10.37 per cent.; *Q. rubra*, L., 4.55 to 5.27 per cent.; *Q. velutina*, Lam., 7.77 per cent.; *Q. coccinea*, Wang., 12.66 per cent.; *Q. digitata*, March., 5.98 per cent.—Amer. Jour. Pharm., Nov., 1896, 601–604.

CONIFERÆ.

Coniferæ—Characters, etc., of Some North American Species.—In continuation of the series of papers abstracted for the "Report" of 1896 (see Proceedings 1896), Edson S. Bastin and Henry Trimble (in Amer. Jour. Pharm., July, 1896,) gave a description of the general characters of the genus

Picea.—About a dozen species compose this genus, the spruces, all of them inhabiting the mountainous regions of the north; but only five of them are indiginous to the United States, two in the northeastern and three in the northwestern States, while two are natives of northern Europe and the remaining five are Asiatic. They are straight-boled, evergreen trees, of pyramidal form and rather slow growth; whitish, soft, close-grained and somewhat resinous wood; alternate, acicular, tetragonal leaves, which are very numerous and compactly arranged on the younger branches, and seldom exceed an inch in length.

Picea alba, Link.—The white or single spruce occupies the northern portion of our continent from Newfoundland, through Labrador, the Hudson's Bay region, mouth of the Mackenzie River, and the valley of the

Yukon. It occurs also in the northern portion of the United States from Maine to the Pacific and British Columbia. Its wood, which is made into lumber, is straight-grained, light yellow, soft and light, and not very strong; but the root fibres are very tough, and properly prepared, are used by the Indians of the north in stitching their birch-bark canoes. Under favorable conditions the tree reaches a height of 150 feet, though seldom reaching a height of 100 feet in the eastern portion of the United States. After a description of the tree and of the microscopic structure of the small twigs and leaves, the authors give the results of the proximate examination of specimens of the leaves, stem-bark and root-bark of a white spruce tree, cut in March, 1896, the results being shown in the following:

	Moisture.	Ash in absolutely dry sample.	Tannin in absolutely dry sample.	Extract yielded to absolute alcohol.	Extract yielded to petroleum ether.
Leaves......	8.26 p. c.	5.29 p. c.	7.89 p. c.	24.99 p. c.	3.91 p. c.
Stem-bark...	8.17 "	4.11 "	21.63 "	33.25 "	3.62 "
Root-bark...	8.72 "	9.81 "	19.09 "	33.49 "	2.81 "

The tannin evidently belongs to the oak-bark group of tannins. The respective portions, after treatment with absolute alcohol, yielded considerable quantities of glucose and mucilage to water.

Picea nigra, Link.—The black or double spruce is a tree of moderate size, attaining a height of not more than 70 feet. It is found from Labrador, throughout Canada, to the Mackenzie river, along the slopes of the Rocky Mountains, and in the northeastern portion of the United States. Its wood is like that of the preceding species, straight-grained, soft and light, but rather compact and usually of a reddish color, and is much used for lumber, the construction of spars and keels of vessels, etc. The twigs are used in the eastern United States and Canada for brewing "*spruce beer.*" The authors give a general description of the tree, and of the microscopic structure of the stems and leaf. A sample of branch bark, collected in the Adirondacks, yielded the following percentage results:

Moisture, 9.95; ash in absolutely dry bark, 2.72; tannin in absolutely dry bark, 12.13.

The black spruce is also interesting as the source of "*spruce gum,*" which exudes spontaneously from decayed knots or seams caused by extremes of heat and cold, and the collection of which is quite an industry in Maine, New Hampshire, Vermont and Canada.

Picea pungens, Engelmann.—The Colorado blue spruce, a tree attaining a height of 150 feet, occurs in Colorado, Wyoming and Utah. Its

wood is very similar in its texture to that of the spruces already described, but the principal use of the tree is for ornamental purposes in parks and lawns, on account of its beautiful color and compact habit. Cross sections are shown of the stem and leaf, and the following result of the proximate examination of the stem and root bark is given:

	Moisture.	Ash in absolutely dry bark.	Tannin in absolutely dry bark.	Extract yielded to absolute alcohol.	Extract yielded to petroleum ether.
Stem bark...	10.47 p. c.	4.21 p. c.	8.66 p. c.	17.43 p. c.	3.59 p. c.
Root bark...	10.65 p. c.	5.03 p. c.	17.51 p. c.	26.37 p. c.	3.30 p. c.

The tannin evidently belongs to the oak-bark group.

Picea excelsa, Link.—The Norway sprucc, one of the largest and finest trees of its genus, attaining often a height of 180 feet and a trunk diameter of 6 feet, although not indigenous to the western continent, has become a firmly established species. The tree is particularly interesting to pharmacists because it yields the resin known as "Burgundy pitch," which is produced principally in Finland, in small quantity in Germany and Switzerland, and none ever in Burgundy. Its light, elastic, not very strong wood, is valued in the cabinetmakers' art because of its fine grain and the high polish that may be produced upon it. Modernly, also, the wood of the Norway spruce has come into extensive use for the manufacture of paper. Descriptions of the microscopic structures of the stem and leaf are given, together with the results of the proximate examination of the stem and root bark as follows:

	Moisture.	Ash in absolutely dry bark.	Tannin in absolutely dry bark.
Stem bark	11.37 per cent.	4.98 per cent.	15.40 per cent.
Root bark	11.32 per cent.	6.11 per cent.	15.39 per cent.

The tannin is evidently identical with that observed in the previous species.

Abies balsamea, Link.—The characters of distinction of the genus *Abies* having been briefly described by the authors, they give a description of the common balsam fir, and of the microscopic structure of a two-year-old twig and of a leaf. The balsam fir, also called balm of Gilead fir, occurs throughout our northern borders, from Maine to Minnesota, northward to

Hudson Bay, and on the eastern slopes of the Rocky Mountains. It is interesting as yielding the oleo-resin, "balsam of fir," about 5,000 gallons being collected annually in Canada, while its wood is valued for masts, and the tree itself for ornamental purposes. A proximate analysis of the leaves, stem and root bark gave the following results:

	Moisture.	Ash in absolutely dry material.	Tannin in absolutely dry material.	Extract yielded to absolute alcohol.
Root bark..........	9.89 per cent.	5.68 per cent.	11.93 per cent.	18.55 per cent.
Stem bark..........	9.36 "	3.37 "	12.49 "	18.07 "
Leaves.............	10.18 "	4.48 "	5.13 "	13.53 "

An ultimate analysis of the tannin yielded 1 per cent. more hydrogen than obtained from a number of other tannins of the oak-bark group, to which it nevertheless seems to belong according to its reaction.

Abies Fraseri, Lindley.—This species, commonly called double fir, occurs at high elevations in the mountains of Tennessee and North Carolina. The tree is noted for its hardiness, and is used for ornamental purposes. It is also said to have been used to furnish a balsam of fir similar to that obtained from *A. balsamea*, but the data concerning this are obscure. The proximate examination gave the following results:

	Moisture.	Ash in absolutely dry material.	Tannin in absolutely dry material.
Root bark	9.63 per cent.	2.24 per cent.	12.28 per cent.
Stem bark	8.95 "	2.52 "	11.03 "
Leaves	6.85 "	3.46 "	6.93 "

The tree yielding the material was taken from the ground in Tennessee, July, 1896.

Abies Nordmanniana, Spach.—This is a cultivated ornamental tree, a native of the Crimea and the Caucasus Mountains. The root bark yields 9.14 per cent. and the stem bark 10.52 per cent. of tannin. The material was collected in April, 1896. The authors also obtained a small quantity of the bark of

Abies Webbiana, Lindley, a Himalayan species of fir. The dry material contained 1.90 per cent. of ash, and yielded 7.81 per cent. of tannin, belonging to the oak-tannin group.

The hemlocks are next considered by the authors, a brief description of

their general character and distribution being given. The common hemlock,

Tsuga Canadensis, Carr, is common to eastern North America, but is widely distributed, being found westward to Minnesota, and southward, following the Alleghanies, to Georgia and Alabama. Considering the commercial importance of this tree and its products, it has received very little attention by the botanist or chemist. With the exception of two investigations on the volatile oil, nothing has been reported in recent years concerning this plant, so that the text-books of the present time give the results of observations made from twenty-five to fifty years ago. The authors, after giving a description of the microscopic structure of the twigs, bark and leaves, quote liberally from the paper of Chas. Ellis (Journ. Phil. Coll. Pharm., Vol. 2 (= 1830) and of Frederick Stearns (Proceedings 1858), and give the results of some chemical experiments made upon the leaves, the root-bark and the trunk-bark of this tree. Their experiments on the leaves were limited to an estimation of the tannin, resin and ash. Collected in November, after a short exposure to dry air they contained 12.80 per cent. of moisture. They yielded 22.97 per cent. of their weight to alcohol, of which a quantity corresponding to 14.70 per cent. of the leaves was soluble in water. The ash amounted to 3.78 per cent. and the tannin to 1.48 per cent., both calculated for absolutely dry bark. The root-bark contained 11.83 per cent. moisture and yielded 3.96 per cent. of ash and 21.57 per cent. of tannin, the latter being equivalent to 24.46 per cent. in dry bark. The trunk-bark was shown to contain variable proportions of tannin according to the season of the year and other circumstances, as is shown in the following table:

Date of Collection.	Locality.	Moisture in absolutely dry bark.	Ash in absolutely dry bark.	Tannin in absolutely dry bark.	Source of Bark.
May 12, 1895....	Near Philadelphia.	20.06	1.46	8.22	Small tree.
June 30, 1895....	"	15.54	3.03	9.82	Bark of a branch.
Aug. 1, 1895....	"	10.00	2.51	14.77	Small tree.
Oct. 27, 1895....	"	11.90	1.21	15.12	"
Nov. 28, 1895....	"	14.01	1.43	15.45	Medium tree.
Jan. 17, 1897....	"	13.45	1.58	13.05	"
May 1896....	Tennessee	10.73	1.56	10.60	Large tree.
June 1896 ...	"	10.43	1.40	14.96	"
July 1896....	"	10.98	1.29	11.34	"

For the purpose of determining the properties and ultimate composition of the tannin of hemlock bark, the authors prepared considerable quantities in a pure condition, and conclude from their results of study and investigation that it is identical with the other tannins of the Coniferæ which

have so far been studied by them, as well as with the tannin of oak bark, and a number of others from a variety of sources. These results differ from those obtained by Boettinger, in 1884—the only other investigator of hemlock tannin—who concluded from his figures that the tannin had a composition expressed by the formula $C_{28}H_{20}O_{10}$; but it is reasonable to attribute this difference to the fact that Boettinger operated upon a commercial extract of hemlock bark.—Am. Jour. Pharm., Feb., 1897, 90–97.

Cedars—West Indian Varieties.—Hart gives a list of eleven trees which bear the name of cedar in the West Indies. The pencil cedar is, strictly speaking, *Juniperus virginiana*, but the *J. bermudiana* is also used for the same purpose, the wood of the two trees being practically indistinguishable. The cedar of Lebanon, *Cedrus Libani*, Barrel, and its two varieties, the African cedar, *C. Atlantica*, Manetti, and the Indian cedar or deodar, *C. deodara*, Loud., do not appear to be distilled for oil. Other trees known as cedars are the West Indian white cedar, *Tecoma leucoxylon*, Mart.; the American red cedar, *Thuja occidentalis*, Linn.; the Californian white cedar, *Libocedrus decurrens*, Torr.; the New Zealand cedar, *Libocedrus Bidwillii*, Hook.; the Australian red cedar, *Cedrela toona*, Roxb.; and the West India cedar, *Cedrela odorata*, Linn. The last is of interest as being the wood of which cigar boxes are made. It is also largely used for cabinets, wardrobes, etc., in the West Indies, since insects have a strong dislike both to the odor and taste of the wood. It would seem, therefore, that the volatile oil, of which Messrs. Schimmel obtained 3 per cent., would be more valuable than that of *Juniperus virginiana* as an insectifuge. The waste wood from the manufacture of cigar boxes could easily be utilized for this purpose. The oil has a specific gravity of 0.915, and boils between 265° and 270°, and has an optical rotation of 5°.053 in 100 Mm. tube.—Pharm. Jour., Aug. 29, 1896, 179; from Bull. Bot. Gardens, Trinidad, July, 181.

Yew Leaves.—Process of extracting their alkaloidal constituent, *Taxine*, which see under "Organic Chemistry."

UNCLASSIFIED.

Balsamorrhiza Terebinthacea—A New Drug from Idaho.—L. E. Sayre calls attention to a new drug, the root of *Balsamorrhiza Terebinthacea*, growing in western Idaho and eastern Oregon, and reported to have marvelous virtues. The root, as received by the author, is much contorted, varying in length from 1 to 6 inches, sub-cylindrical and having a triangular tendency. It has a large crown, composed of numerous branches, which are densely covered with closely appressed hairs that extend and mingle themselves among the overground stems which surmount each branch. Externally, shaded from light brown to almost black, deeply fissured from the uniting of branches and frequently annulate. The wood fibers are light yellow or nearly white; the root is of an open, spongy

texture, the pores being filled with a brownish-yellow resinous balsam. This gives a cross-section a mottled appearance, having no zones, medullary rays or pith visible. The root has a strong terebinthinate odor, and is very inflammable, producing much smoke when burned. The taste, which is its most characteristic feature, is exceedingly pungent and aromatic, producing a persistent tingling sensation upon the tongue and throat. Subjected to proximate examination by Miss Herma T. Kelly, the powdered root lost 9.25 per cent. when dried to constant weight, yielded 5.72 per cent. of ash, containing principally lime, together with potassium, sodium, magnesium, iron and phosphoric acid. Chloroform removed 15.24 per cent., containing volatile oil, 0.42 per cent., fixed oil, 5.28 per cent., resin, 8.96 per cent., undetermined, 0.58 per cent. Alcohol then removed 4.20 per cent., of which 0.8 per cent. was resin, and the remainder soluble in water. Organic acid was present in this to the amount of 0.40 per cent., and sugar to the amount of 0.25 per cent., but no alkaloidal reactions were obtained from the purified aqueous solution. The aqueous extraction yielded 1.40 per cent. of gum, and a trace of dextrin and glucose. Subsequent treatment with acidulated and alkaline water, removed starch and other inert soluble principles, and left 7.65 per cent. of cellulose.—Drugg. Circ., Feb. 1897, 32.

Salvadora oleoides, Dene. (*Salva loraceæ*)—*Description and Uses of the Bark of the Root and Fruit.*—Prof. Hartwich has examined specimens of the bark and fruit of *Salvadora oleoides*, Denc., a plant found in the Pundsjab and in Afghanistan, where the leaves, bark and fruit find medicinal use. The plant is used in India as a vesicant, and is said to have a cress-like odor and sharp taste; but both of them are absent in the samples examined by the author, notwithstanding that the bark, as the author believes, is genuine, its structure agreeing well with the account given by Dymock in "Pharmacographia Indica" and by Mœller, in "Baumrinden," of the stem bark of *Salvadora Persica*, Garcin. It is very probable that the above constituents, in which the characteristics given consist, are of a temporary nature, and disappear upon long preservation, by which probably the medicinal value is likewise affected. The dried bark contains some alkaloid, its content was found to be 0.109 per cent. Tannin is lacking. Dymock attributes the action of the fresh bark to trimethylamine present. The bark is about 1 Mm. thick, exteriorly grayish-yellow with soft cork. In young pieces, the cork is narrow; the cells throughout are thin-walled. Older pieces show abundant cork formation which extends into the bast. The middle bark consists of parenchyma, some cells of which contain starch. The medullary rays in the bast reach a width of 3 cells, becoming broader toward the outside, the cells little elongated radially. The bast rays in the younger barks consist exclusively of soft bast with isolated, strongly thickened, much pitted, axially elongated stone cells, which in the older barks appear in greater numbers, but never united

into groups. The author could find but few sieve tubes. The fruits are said to act as a diuretic, and are used especially in gravel. An oil which they contain is used for rheumatism and after confinement (obviously externally). The oil-content of the fruit is 27.77 per cent. The oil is of a grayish-yellow color, with agreeable, mild taste, at usual temperatures solid, melting at 38°. The alkaloid-content of the fruit is greater than that of the root bark; it was found to be 0.58 per cent. Unfortunately, in both cases, the quantity present was so small that it was impossible to pursue further investigations. The usual reactions for alkaloids (mineral acids alone and in combination with iron chloride, bromine and potassium hydroxide, etc.) give no noticeable results. The fruits are 6—7 Mm. long, 4 Mm. thick, yellowish-brown to brown, smooth or wrinkled; at the base are found the fruit pedicel, sometimes 2 Mm. long, and the remains of the calyx. The fruit covering is thin, papery and brittle, and encloses an albuminous seed with thick cotyledons which envelop the radicle.—Pharm. Rev., Nov., 1896, 257; from Gehe's Bericht, Sept., 1896.

Balanites Roxberghii, Planch.—Uses of the Fruit.—Among the East Indian drugs recently exhibited at Dresden is the fruit of *Balanites Roxberghii*, to which Prof. Hartwich calls attention on account of its manifold uses in India. When unripe it is regarded as an anthelminthic and purgative. The dose is about the half of the pulp of one fruit; in smaller doses it favors the excretions. As anthelminthic it is also much used for cattle. It contains a principle closely related to saponin, to which its action is probably due. The ripe seeds contain about 50 per cent. of a fatty oil (Zachun oil) which is tasteless, of a yellowish color and bleaches easily in the sun. Sp. gr., 0.9185. It belongs to the slowly-drying oils and in many directions resembles the arachis-oil (peanut oil). It is used for burning and in medicine externally on wounds.—Pharm. Rev., Oct., 1896, 232; from Gehe's Bericht, Sept., 1896.

Andrographis paniculata, Nees.—Medicinal Uses.—Dr. Hartwich calls attention to *Andrographis paniculata*, a plant which is valued in its home —India, Ceylon and Java—on account of its bitter tonic qualities, which are similar to gentian, quassia, etc. The plant has been introduced in the West Indies and Mauritius, and is now being marketed.—Pharm. Rev., Oct., 1896, 231; from Gehe's Report, Sept., 1896.

B. Animal Drugs.

Leeches—Method of Preservation.—A writer in "Pharm. Ztg" (xli., 504), who has previously had considerable difficulty in keeping leeches without incurring considerable loss, recommends the following method as being excellent: A thin layer of coarse, washed sand is strewed on the bottom of the container, together with some clean, washed straw. This requires renewal every six months; and, according to the season, the water

—1 liter to 10 leeches—must more or less frequently be replaced, thoroughly cleaning the jar each time. Treated in this manner, the leeches retain their vitality almost indefinitely, and the loss is very exceptional. Merck's Report, Sept. 15, 1896, 486.

Indian Cantharides—Description, etc.—Prof. Hartwich describes Indian cantharides recently exhibited with other Indian drugs at Dresden. The beetles are of a somewhat cylindrical form, black, with exception of the wing-covers, which are yellowish-brown with black transverse bands. They belong to the genus *Mylabris*, which contains a whole series of vesicle-forming species. It is not improbable that the kind exhibited is of real value for the preparation of cantharidin, since many species of the genus contain much more cantharidin than *Lytta vesicatoria*. Since it is, however, well known that by careless storage the cantharidin content is much decreased, which is probably the case with the specimen at hand, since most of the beetles lack abdomen and head, consisting, therefore, mainly of thoracic segments and the wings, a determination of the cantharidin was out of the question.—Pharm. Rev., Oct., 1896, 232; from Gehe's Bericht., Sept., 1896.

Honey—Curious Observation Concerning a Poisonous Kind.—Gerpen records the observation that after having deposited the honey in their cells, certain American bees collect the pollen of the male Indian corn, and work it well into the honey. If the honey is used before this operation has taken place, it ferments quickly and produces griping and violent diarrhœa.—Pharm. Monatsh., ii., 45.

Honey—Intoxicating Effect Upon Humble Bees.—J. L. William has observed a singular effect produced on some humble bees by the honey of some flowers with very crowded capilular inflorescence, especially those of *Centaurea scabiosa*, *Carduus nutans*, and *Scabiosa succisa*. The phenomena produced on the bees were those of intoxication, raising the legs convulsively in the air, turning on their backs, and rolling about helplessly. In so doing, their bodies became thickly covered with pollen, to the promotion of the pollination of the flowers in question. As a rule, the bees rapidly recovered from the intoxicating effects, and were eager to renew the experiment; but in one instance the insect, which had been shut up all night in a vasculum with flower-heads of *Centaurea scabiosa*, showed, the next morning, the greatest aversion to being placed again in the way of temptation. The species which showed the greatest tendency to succumb to temptation was the neuter of *Bombus lapidarius*.—Pharm. Journ., Feb. 27, 1897, 163; from Journ. of Botany, 1897, 8.

Cod-Liver Oil—Improvement in the Product from Newfoundland.—From a report of the Newfoundland Department of Fisheries it is gratifying to learn that the manufacture of refined cod-liver oil, on the modern and more profitable method, is making rapid progress, and is likely to

prove remunerative to those who have taken it up. The superintendent has been actively engaged in giving instructions to all who sought his assistance, and aiding them in fitting up the necessary apparatus for manufacturing the steam-refined and frost-proof cod-liver oil, which he was the first to introduce here. Already it has been proved that the article manufactured here by the new method is quite equal to the best Norwegian cod-liver oil, which hitherto has had a world-wide reputation, and commanded the highest prices in the markets. Hitherto the Newfoundland oil could not compete with the Norwegian, and was only able to command very low prices; and yet the livers of the Newfoundland fish, when properly treated, yield an oil which in quality and richness can not be surpassed. The superintendent says in his report that "the livers of our cod are almost always found in excellent condition, which is due to the temperature of the water and the abundance of fine food which these waters contain; and it is but rarely that any unhealthy or diseased livers are found. Tests instituted in Canada have proved that "our oil, when properly made, excels even the Norwegian in quality, being richer and more free from stearin, and consequently more frost-proof."—West. Drugg., Feb. 1897, 63.

Cod-Liver Oil—Correction of Taste by Means of Coffee.—Schneider recommends a method for correcting the taste and odor of cod-liver oil, which consists in mixing with 400 Gm. of the oil, 20 Gm. of ground coffee, and 10 Gm. of animal charcoal, and, after subjecting the mixture to a heat of 60° C. for 15 minutes in a well-closed vessel, allowing it to stand for several days, shaking frequently, and then filtering off the oil, which will be very slightly colored, besides having acquired the odor and taste of the coffee. A further advantage of this method of correcting the taste of cod-liver oil is in that it does not in the least degree lessen its therapeutic value or its digestibility.—Merck's Rep., July 15, 1896, 258; from Pharm. Ztg., xli., 393.

Eggs—Therapeutic Use.—According to the "Medical Record," eggs are useful for a variety of therapeutic purposes: A mustard plaster made with the white of an egg will not leave a blister. A raw egg taken immediately will carry down a fish-bone that cannot be extracted. The white skin that lines the shell is a useful application to a boil. White of egg beaten up with loaf sugar and lemon relieves hoarseness, a teaspoonful taken once every hour. An egg in the morning cup of coffee is a good tonic. A raw egg, with the yolk unbroken, in a glass of wine, is beneficial for convalescents.

Musk—Recently Observed Adulterants.—J. T. Hornblower, while he has never come across the blood or liver "substitutes" in musk, mentioned by Pereira, has frequently met with cut skin, hair, paper, and small lumps, and even bars of lead. Recently he observed a substance which had all

the appearance of red sand, but on analysis this proved to be cinnabar. The musk pod containing this is stated to have been one of the best kinds. the blue-skin Tonquin. Mr. Conroy stated that he had at various times found ground coffee.—Pharm. Jour., Nov. 28, 1896, 474; from Proc. Liverpool Chem. Assoc., Nov. 19, 1896.

Civet—Comparison of an Authentic with Commercial Specimens.—J. Oldham Braithwaite having obtained an authentic specimen of civet supplied from civet cats in the Zoological Society's Gardens, has subjected it to a comparative examination with commercial specimens. The civet obtained from the gardens was a chocolate-brown stiff mass, resembling date pulp in consistence. The odor was distinctive, powerful, and not unpleasant. The reaction was faintly acid. Examined with a lens, it was seen to contain much sawdust derived from the animals' cage and numerous hairs. It lost 6.45 per cent. on drying, and gave 4.9 per cent. of ash, but these figures are not of any value for comparison, on account of the presence of the sawdust. Upon spreading a weighed portion on an Adam's paper and extracting it with light petroleum ether in a Soxhlet apparatus, it was found that the exhausted residue consisted almost entirely of sawdust and hairs, and was practically odorless, showing that the pure secretion is almost wholly soluble in petroleum ether. The extracted portion deprived of the solvent and cautiously dried amounted to 39.9 per cent. This extracted portion consisted of a soft brown fatty matter, a little firmer than butter, and possessing the powerful but fragrant odor of original sample, and may be considered pure "civet." The total acid number and the volatile fatty acid number of this fatty substance having been determined by well-known methods, these samples of commercial civet were examined in a similar manner, the results being shown in the following table:

	Sample from Zoological Garden Freed from Sawdust).	Commercial Sample A.	Commercial Sample B.	Commercial Sample C.
Loss at 100°	+	30.1	12.5	23.4
Ash	+	2.1	4.4	3.9
Petrol. Ether Ext.	Almost wholly soluble.	62.9	70.7	50.
Total Acid, No. of Petrol. Ether Ext.	140	108	166	175
Volatile Acid, No. Pet. Ether Ext.	32.3	11	11.5	9
Nature of Residue in Petrol. Ether	Hairs, etc.; almost odorless.	Dry, slight odor, stercoraceous.	Dry, slight odor, stercoraceous.	Moist, sticky, strong stercoraceous odor.
Sugar in Residue Insol. in Petrol. Ether	None.	None.	None.	Present in quantity.

The commercial samples all differed from the authentic sample in odor, having much more the smell of rancid butter and less the agreeable musky odor. The residues, after extraction with petroleum-ether, had a more or less fæcal odor, and in the case of C. contained sugar, whilst in the authentic specimen it consisted only of sawdust and hair, as already noted. —Pharm. Jour., Feb. 6, 1897, 101.

Castor—Analysis of Fresh Pouches.—J. Gal has subjected the castor from the pouch of a recently killed Gardon beaver to analysis. The fresh pouch weighed 84 grammes, the castor 16.3 grammes. The latter was yellowish-white, of characteristic odor, and had a density of 0.85. It contained 4.3 per cent. of albuminoids, lost 7.9 per cent. at 100°, yielded 0.25 per cent. of ash, and yielded to ether 88.4 per cent. of its weight, and only 0.8 per cent. to alcohol afterwards. These figures differ markedly from those obtained by Lehman for German, Russian and Canadian castoreum, which were:

For the ether extract	7.4	2.5	8.2
For the alcoholic extract....................	69.7	64.3	41.3

but the marked differences between these and Gal's figures is probably due to the age of the products examined and, possibly, to a total alteration in the nature of the secretion. The presence of castorine and carbolic acid was not indicated in the fresh specimen, though the Gardon beavers feed on willow bark.—Pharm. Journ., Feb. 27, 1897, 161; from Comptes rendus, cxxiv, 246.

Skunk Secretion—Analysis.—T. B. Aldrich has investigated the chemical composition and physical properties of the matter emitted by the skunk,

Mephitis mephitica, when hunted or otherwise frightened. The matter, taken directly from the sac which communicates with the anal glands of the animal, had a lower sp. g. than water, was of a golden color, and burned with a bright flame, with liberation of an irritating sulphurous vapor. It was neutral to litmus paper, and answered all the reactions for mercaptan and some of those for allyl-sulphide. By distillation it was split up into two well-defined liquids of almost equal quantity; one of these, distilling over between 100–130°, retained the acrid odor and the reactions referred to, while the portion distilling over above 130° had a less pungent odor, and only gave a few of the allyl-sulphide reactions, but did not respond to the well-known mercaptan reactions either with acetate of lead or with red precipitate. In addition to mercaptan and allyl-sulphide, it contained traces of butyl-mercaptan. The matter is a powerful irritant, and possesses anæsthetic properties.—Chem. and Drugg., Jan. 2, 1897, 16.

INORGANIC CHEMISTRY.

GENERAL SUBJECTS.

Colorimetric Tests—Limit of Accuracy Attainable.—Charles W. Folkard, as the result of a large number of experiments, has come to the conclusion that analytical processes depending on the exact imitation of the color of a solution of unknown strength by another solution containing a known amount of the substance, are capable of affording results of far greater accuracy than has been generally supposed. By taking proper precaution it is possible to work colorimetrically to within one-fortieth or one-fiftieth —say 2 per cent.—and by average to within 1 per cent. of the quantity of substance present. Experience has afforded ample confirmation as regards azure blue, yellow and red solutions, and the author is led to call attention to this in the hope that others may be induced to communicate their experience with colorimetric testing.—Chem. News, Feb. 12, 1897, 73.

Neutrality of Salts—Determination by Colored Indicators.—Lescœurs observes that the divergence of opinion respecting the neutrality of salts is due to a misinterpretation of the signs furnished by litmus, which is reddened by many neutral salts, such as zinc sulphate, aluminum sulphate, etc. This misinterpretation is confirmed by a study of other indicators. Thus, phenolphthalein is colorless, but goes red with alkali; it does not combine with insoluble oxids. If alkali is poured into a medium containing an insoluble base, and an acid in excess, the liquid remains colorless until complete neutralization, and complete precipitation of the oxid, the reddening only occurring when there is an excess of alkali. In a word, phenolphthalein indicates, not the passage from acid to alkali, but the passage from neutrality to alkalinity. This is similar to litmus, but sharper. On the other hand, helianthine, or orange poirier 3, is an acid indicator, colorless in alkali or neutral, but taking a red with acid. If, into a solution of metallic oxid with excess of acid, alkali is poured, with this indicator the pink liquid does not become yellow, until the whole of the acid is saturated; only then commences the precipitation. Helianthine thus shows a passage from acidity to neutrality; the showing being the opposite of that which happens with litmus and phenolphthalein. Combining the showing of these two orders of coloring matters, the condition of neutrality obtains great precision. The red of phenolphthalein and the blue of litmus indicates the presence of free alkali, and the pink of helianthine shows a free acid; the term neutral is reserved for the condition of a medium in which both helianthine and phenolphthalein remain colorless, and litmus would be red. It will be noticed that the salts of aluminum, and sulphate of zinc, though acid to litmus, are neutral to colored indicators, and in reality the neutrality of salts is in accordance with theory and the action of

colored indicators.—West. Drug., June, 1897, 264; from Montreal Pharm. Journ.

NEW ELEMENTS.

Lucium—A New Element.—In the course of researches on monazite sand, P. Barrière appears to have discovered a new elementary body, to which he has given the name *lucium*. According to the results obtained by Prof. Schutzenberger, confirmed by those of Cleve, Frerenices, and Lecoq de Boisbaudran, lucium dissolves in sulphuric, nitric or acetic acid, forming salts either white or slightly tinted with rose-color, and all of these are soluble in water, forming limpid, colorless solutions. Its salts differ from those of other elements of the same group as follows: from those of cerium, lanthanum and didymium, in not forming insoluble double salts with sodium sulphate; from those of thorium and zirconium in not forming insoluble double salts with potassium sulphate; from yttrium, ytterbium and erbium, in that its chloride is precipitated by sodium thiosulphate; and from glucinum, in that its salts are precipitable by oxalic acid. The spectral rays of lucium are special, and only approximate slightly to those of erbium. It is further distinguished from erbium in that its oxide, on ignition, is white instead of rose-colored, its nitrate white instead of red, and the aqueous solutions of its salts, containing even 15 to 20 per cent., are almost colorless, whereas those of erbium salts are red or rose colored. The atomic weight of lucium is calculated as being 104. The author proposes to use the new element for the production of an incandescent gas light in opposition to that of Auer von Welsbach.—Chem. News., Sept. 25, 1896, 159.

Lucium—Not a New Element.—William Crookes, having obtained from the patentee of "lucium," Mr. P. Barrière, a solution of lucium nitrate, and a larger quantity of precipitated oxalate, has made experiments which convince him that the claim of lucium to form one of the chemical elements is not justified, but that it is simply impure yttrium. He gives the details of his experiments from the results of which he forms his conclusions.—Chem. News, Nov. 27, 1896, 259–260.

OXYGEN.

Oxygen—Accurate Determination with Pyrogallol.—Professor Frank Clowes has found that during the absorption of oxygen from the Briss gas a considerable volume of carbon monoxide was evolved, although this did not occur in absorbing oxygen from the air. Repeated trials made with varying proportions of pyrogallol and potassium hydrate, showed that the evolution of carbon monoxide might be entirely prevented by using a sufficient excess of potassium hydrate, and with the following proportions, no fear of this source of error need be felt, even when pure oxygen is being absorbed: 160 Gms. of potassium hydrate and 10 Gms. of pyro-

gallol in 200 Cc. of solution—this solution requiring 130 Cc. of water.—Chem. News, Oct. 23, 1896, 199.

Oxygen—Antiseptic Application to Wounds.—Some remarkable results obtained in the treatment of wounds by exposing the affected parts to the action of oxygen gas, either alone or diluted with air, have induced Dr. G. Stoker to experiment with it in this direction. He describes how bacteriological examination of wounds, before and after this treatment, shows that oxygen destroys some micro-organisms that are present, and encourages the growth of others which are characteristic of healing wounds. As a result, cures are rapidly effected by this method, and Dr. Stoker is of opinion that it heals in less time than any other form of treatment, allaying pain, stopping foul discharges, forming a healthy new skin, and being far more economical as regards suffering, and less expensive pecuniarily. This oxygen treatment has been taken up by an influential committee, and this committee, desiring to afford opportunities for the development of this treatment, has resolved on the establishment of a home at which patients may be received, and medical men and nurses initiated into the details of the system.—Pharm. Journ., Nov. 28, 1896, 458; from Brit. Med. Journ.

HYDROGEN.

Hydrogen Peroxide—Preparation of Concentrated Solutions.—P. Schiloff utilizes the solubility of hydrogen peroxide in ether for preparing pure concentrated solutions. The commercial peroxide is made distinctly alkaline with sodium carbonate, shaken with 10 to 12 volumes of ether for three to five minutes, the ether solution decanted, and the ether is evaporated (distilled) on a water bath, and finally, to expel last portions of ether, on a paraffin bath. During these operations but little peroxide is lost, and the product contains about half the peroxide present in the original solution. It is colorless, has a distinct acid reaction, the sp. gr. 1.1756, and contains 54 per cent. H_2O_2, but may be concentrated to a sp. gr. 1.2475, when the solution contains 79.57 per cent. H_2O_2, and has a slight yellowish color. Obtained in this way solution of hydrogen peroxide contains no mineral acid, is not rendered cloudy by silver nitrate, and gives with barium chloride a precipitate which is perfectly soluble in hydrochloric acid.—Ch. News, July 17, 1896, 38; from Zeitschr. Anal. Chem., xxxv., No. 1.

Hydrogen Dioxide—Preservation of Its Solutions.—Sunder states that the addition of 2 per cent. of alcohol or ether serves to keep hydrogen-dioxide solution perfect for several weeks, and that the preparation suffers no loss of oxygen in that time, as shown by the control tests made by Freyss. He states that the substitution of these for the diluted sulphuric acid heretofore used is especially valuable in so far as the disturbing element so frequently introduced by the acid may be avoided; and this is particularly the case where the medicinal hydrogen peroxide is in question. —Merck's Rep., April 15, 1897, 244; from Pharm. Ztg., 1897, 155.

Hydrogen Dioxide—Commercial Quality.—R. G. Eccles, for the purpose of ascertaining how near to pharmacopœial requirements, has examined eight commercial samples in unopened packages, and subjected them to the tests of the U. S. Pharmacopœia, with the results shown in the table. Besides these eight samples, which were sold by the name recognized by the Pharmacopœia, two samples bearing fancy names (Nos. 9 and 10 in the table) were examined, together with a sample of the pharmacopœial article (No. 11).

TABLE OF RESULTS OF ANALYSIS OF HYDROGEN DIOXIDE.

No.	1 Cc.$=\frac{N}{10}$ $KMnO_4$.	Vols. of O.	Barium.	50 Cc.$=\frac{N}{1}$ KHO.	HFl.	Acids.
1	26.0 Cc.	14.56	None.	1.37 Cc.	None.	H_2SO_4+HCl.
2	19.0 "	10.64	"	0.45 "	"	H_2SO_4+HCl.
3	17.3 "	9.69	"	0.10 "	"	H_2SO_4.
4	18.2 "	10.19	"	0.60 "	"	H_2SO_4.
5	18.9 "	10.58	"	4.00 "	"	$H_2SO_4+H_3BO_3$.
6	18.2 "	10.19	"	0.50 "	"	H_2SO_4.
7	8.5 "	4.76	"	0.90 "	"	H_2SO_4+HCl.
8	17.8 "	9.96	"	1.10 "	"	H_2SO_4.
9	47.5 "	26.60	"	1.90 "	"	H_2SO_4+HCl.
10	18.0 "	10.08	"	0.55 "	"	H_2SO_4.
11	18.0 " *	10.00*	"	0.50 " *	"	H_2SO_4.

* Indicates about.

A glance at the table will show that most of the samples were as true to the requirements as one could reasonably expect from so unstable a preparation. With the exceptions of number one that is far too high and number seven that is far too low, the samples are all fairly well within the proper limits. The acid in number five, while seemingly very large in amount, is discovered to be not a strong mineral acid, but bland boric acid, and is, therefore, rather a benefit than an injury. Not one of the samples contained a trace of barium salt, although one of them is claimed by a rival house to contain the same. The fact that it contains free sulphuric acid proves positively that the charge is not true.—Drugg. Circ., Dec., 1896, 299.

Hydrogen Peroxide—Convenient Method of Assay.—J. F. Brown has found the method proposed by Moerck (in Proceedings 1893, 772) reliable for estimating hydrogen peroxide, accurate, simple and easily worked. To render it available for those who may not have at command metric weights and measures, he suggests that the permanganate solution be made of such strength that 200 minims will consume 20 minims of hydrogen peroxide, *i. e.*, 2 volumes of the test solution consume 1 volume of a 20 vol. solution of hydrogen peroxide. Such a solution is obtained by dissolving

9.57 grains of potassium permanganate (in practice 10 grains) in 4000 minims of water. The test is then carried out as follows: To a pint of water contained in a 32 oz. or 40 oz. clear white glass bottle, add 100 minims of dilute sulphuric acid, rinse the measure, and then add exactly 100 minims of the hydrogen peroxide. Unless the precaution of rinsing the measure be taken, evolution of gas begins in it, and a trifling error results. Now pour in cautiously the permanganate solution, with frequent agitation, until a permanent pink color is produced. Measure the residue of the solution to ascertain the quantity used, which, expressed in units—of 20 minims—and divided by ten, will give the strength in volumes of the sample tested. For example, in a test recorded by the author, the number of units remaining was 6, indicating that 194 units had been consumed, which, divided by 10, gave a percentage of 19.4 (practically 20) volumes. —Pharm. Journ., Sept. 26, 1896, 271.

Water—Purification for Hypodermic Solutions.—Sidney Rauschenberger recommends the following method for preparing pure and sterilized water suitable for making hypodermic solutions: One gallon of boiled hydrant water is treated with potassium permanganate in portions of 1/8 grain dissolved in 1 ounce of water at a time, until, after standing one hour, it retains a delicate pink tint. Then 5 grains of alum are added, and the water is shaken frequently until the pink tint has disappeared, when it is filtered three times through a double thickness of filter paper, which has previously been scalded to render it sterile. The process must be conducted in well-closed glass containers, and during the filtration the funnels should be covered with well-fitting rubber covers of the kind known as "sanitary covers." If proper precautions are observed in the preservation and dispensing of water so sterilized and purified, it will prove superior to distilled water, and solutions made from it have kept in the author's experience in a clean and sterilized condition for six months.—Amer. Drug., Dec. 25, 1896, 383.

Pure Drinking Water—The Pharmacist a Purveyor.—A writer in "Amer. Jour. Pharm." (April, 1897, 212–213) suggests that the pharmacist constitute himself a purveyor of pure drinking water to his customers and neighbors by supplying them with filtered water. A good filter, capable of supplying about 10 gallons per hour, need not exceed a cost of twenty-five dollars, and its introduction will probably prove a profitable investment. A little admixture of plain carbonated water added to the filtrate would make it sparkle and be a possible improvement.

NITROGEN.

Nitrous Acid—A Sensitive and Simple Reaction.—Prof. E. Riegler recommends the following simple reaction for nitrous acid, which is dependent upon the conversion of naphthionic acid by the nitrous acid into diazo-naphthalin sulphuric acid, this forming with another mol. of

naphthionic acid and with ammonia a rose-colored compound. About 2 or 3 centigrams of crystallized naphthionic acid and 5 to 6 Cc. of the liquid to be examined for nitrous acid are shaken together in a small test-tube, 2 or three drops of conc. hydrochloric acid added, and again shaken thoroughly for a minute. From 20 to 30 drops of ammonia are then allowed to flow slowly into the test-tube whilst held in a slanting position, when, in the presence of even mere traces of nitrous acid, a rose-colored ring appears at the surface of contact of the two liquids, and the liquid upon shaking becomes rose-colored or deep red according to the quantity of the nitrous acid. The presence of nitrous acid in rain and drinking waters can be shown very finely by means of this reaction. Owing to the violet-blue fluorescence of very dilute solutions of naphthionic acid, it is advantageous to examine the color reaction by transmitted light.—Chem. News, Febr. 26, 1897, 98; from Zeitschr. Anal. Chem.

Alkaline Nitrites.—Color reaction with *β-napthol sulphuric acid*, which see under "Organic Chemistry."

Nitric Acid—Profitable Electrolytic Production from the Air.—A German firm has recently patented a process for the production of nitric acid, in form of ammonium nitrate, from the nitrogen and oxygen of the air. Employing an apparatus constructed on the principle of the electrolytic ozone apparatus, a mixture of 1 vol. of atmospheric air, dried by passing it through sulphuric acid, and $\frac{1}{100}$ to $\frac{1}{50}$ vol. of gaseous ammonia, dried by passing it through soda lime, is subjected to the dark electric discharge during its passage through the apparatus. Solid ammonium nitrate is deposited on the walls of the apparatus in practically paying quantities.—Zeitschr. Oest. Apoth. Ver., Aug. 20, 1896, 619.

ARGON AND HELIUM.

Argon and Helium—Hypothesis that they are Polymeric Modifications of Nitrogen and Hydrogen.—Prof. Bohuslav Branner, of the University of Prague, observes that the discoverers of argon and helium, and with them the greatest majority of chemists, regard the new gases definitely as new elements, in spite of the fact that the view, according to which they are peculiar, element-like allotropic (polymeric) modifications of nitrogen and hydrogen, possesses many arguments in its favor. As regards argon, the view that it is N_3 was first pronounced by Dewar, whose view was adopted and defended by new arguments by Mendeleeff, Berthelot, Lothar Meyer, Nasini, the author, and others. As regards helium, the author seems to be the only chemist who regards it as H_3 or H_4. The author, for himself, inclines to the view that argon and helium are allotropic states of nitrogen and hydrogen of a peculiar, entirely novel character. The density of helium, $d = 2$, would correspond to a molecular weight $= 4$, and there would not be a complete analogy between helium and argon, the latter being regarded as N_3. But the recent classical research of Ramsay and

Collie, on the separation of the constituents of helium by diffusion, makes it highly probable that the molecular weights of the two constituents in the pure state are 3 and 5. If there was some possibility of placing *one* helium with a molecular and atomic weight of He = 4 in the new helium-argon group of the periodic system, it is impossible, as long as we do not give up the periodic system in its present form, to find a place for two new gaseous, monatomic, and non-valent elements between hydrogen, H = 1, and lithium, Li = 7, as well as for A = 40.

The author's opinion is this, that nature has effected the synthesis of three substances which behave like elements (or, better, like simple substances, as we speak of molecules) *i. e.*, bodies which it is hitherto impossible to decompose, the molecular, and, with a certain restriction, the "atomic" weights of which equal 3, 5, and 40. The original protylic matter (in the sense used by Crookes) of the first two element-like substances, is hydrogen, and the enormously important bearing of Dr. Ramsay's discovery seems to me to lie in the point that *the constituents of helium were formed from hydrogen in accordance with Prout's law.* The final decision of the question on the constitution of argon and helium must be left to the future; and if the author's views on this point differ considerably from those generally adopted, he thinks it more useful for science to discuss such important, but mysterious, problems as *open questions*, than to adopt prematurely a definite orthodox view.—Chem. News, Nov. 6, 1896, 223–224.

Argon—Occurrence in Plants.—G. Tolomei describes an interesting series of experiments on the presence of argon in plants. The author inferred the absence of argon in fully-developed vegetable tissues. Experiments were also made with the nodule-forming Leguminosæ, and with their nitrifying bacteria, and the results were the opposite of that just cited. In the case of nitrogen obtained from the growing roots of a young pea, argon was obtained from the tissues, but in smaller quantities than from the culture of bacteria; and hence the author maintains that the argon fixed by the bacteria does not enter into chemical combination, on the ground that if it did so, it would, if once absorbed, remain in the plant instead of disappearing in the older tissues.—Merck's Rep., April 11, 1897, 246; from Nature, No. 1426, 399.

Argon—Occurrence in the Blood.—P. Reguard and T. Schloesing have examined the gases obtained from a litre of blood, and found that they contained 20.4 Cc. of nitrogen and argon, the latter accounting for 0.419 Cc. of the mixture.—Pharm. Journ., Feb. 27, 1897, 161; from Compt. rend., cxxiv., 302.

Argon—Existence in Fire-damp.—Schloessing, Jr., has proved the existence of argon in fire-damp and in the gas evolved in the mines of Rochabelle. It seems possible that reserves of the new element may exist in the

depths of the earth, capable of diffusing into the gas around them. Already Bouchard and Troost have found it along with helium in the mineral waters of Cauterets, whilst Ch. Moureu has found it, similarly accompanied, in the waters of Maizières (see Proceedings 1896, 669, 670). Argon seems thus to be as generally diffused in the subterranean regions as it is in the atmosphere, and it is suggested that from this point of view determinations of argon in gases escaping from the earth may yield facts of great interest. —Pharm. Journ., Oct. 3, 1896, 291; from Compt. rend., cxxiii., 302.

Argon—Formation of a Crystalline Hydrate.—P. Villard claims to have combined water with argon to form a crystalline hydrate analogous to those formed by other gases. The gas being subjected to a pressure of about one hundred and fifty atmospheres, in presence of water at 0° C., it sufficed to cool a portion of the tube to cause crystallization locally.—Pharm. Jour., Oct. 3, 1896, 291; from Compt. rend., cxxiii., 377.

CHLORINE.

Chlorine—Replacement by Bromine and Iodine.—H. Lloyd Snape has made experiments to determine whether the chlorine in chlorides of the non-metals can be replaced by bromine and iodine. R. Brix had previously shown that the elements chlorine, bromine and iodine replace one another in many organic haloid compounds, when these are heated with metallic chlorides, bromides or iodides, and it was anticipated that the strongly basic element potassium would readily remove chlorine from its comparatively unstable combinations with the non-metals, and that the latter when liberated would probably unite with the bromine or iodine simultaneously set free. In the majority of cases it was necessary, owing to the readiness with which most of the non-metallic ha oids are attacked by water, to work with absolutely dry materials and out of contact with air. The experiments were, therefore, carried out in sealed tubes, whilst the temperature was regulated when necessary by heating them in a deep glass bath containing paraffin, and an excess of the metallic salt was employed in all instances to avoid the necessity of separating the bromide or iodide of the non-metal formed from any undecomposed chloride. Proceeding in this way, sulphur monochloride, arsenic trichloride, and antimony trichloride were partially converted into their respective bromides by means of potassium bromide, but no similar conversion could be effected by the action of that salt upon carbon tetrachloride and phosphorus trichloride. When potassium iodide was used in the experiments, phosphorus trichloride, arsenic trichloride, and antimony chloride were readily converted into their respective iodides; carbon tetrachloride was only partially attacked, and yielded only free carbon and iodine; sulphur monochloride was much more completely decomposed, but yielded only the elements sulphur and iodine.—Pharm. Jour., July 25, 1896, 62; from Chem. News, lxxiv., 27.

Chlorinated Lime—Commercial Quality in Small Containers, etc.—Prof. Wm. Puckner reports the results of the examination of chlorinated lime carried out under his supervision by students of the School of Pharmacy of the University of Illinois. He observes that while the pharmacist preferably sells chlorinated lime put up in small containers, chiefly perhaps on account of cleanliness and dispatch in handling, but also because he believes it to be superior to that occurring in bulk, since the former is less exposed to the influences of air and moisture, the moderate consumer, laundryman, etc., within recent years generally insists upon being supplied with the bulk variety, much to the disgust of him who has to "dig" for it. In order to compare these two kinds a number of samples were procured from wholesale dealers, those received wrapped in paper being immediately transferred to well-stoppered containers. Three bulk samples contained respectively 34.15, 34.60, and 35.27 per cent. of available chlorine, while only one of three brands put up in small containers, approximated to this percentage, containing 31.50. Two samples of another brand contained 23.30 and 23.65 per cent., and four samples of the third brand were practically worthless, since they contained only 0.11, 0.20, 0.36 and 1.71 per cent. of available chlorine.—West. Drug., June, 1897, 253.

Crude Hydrochloric Acid.—Presence of *Mercury*, which see.

Potassium Chlorate—New Process of Manufacture.—The following new method for the manufacture of potassium chlorate is described by Boyer: Chlorine is led into a cream of zinc oxide and water, until finally a clear solution of zinc chloride and hypochlorite results. The conversion of the hypochlorite into chlorate readily takes place when the solution is heated with the requisite quantity of potassium chloride, and the yield is almost theoretical. A still better plan is to add the requisite quantity of potassium chloride to the zinc oxide and water, and pass the gas into this mixture kept at a temperature of 90°–95°. The resulting solution is evaporated down to 30° B., when, on cooling, the potassium chlorate crystallizes out nearly pure. A further crop may be obtained by evaporating down to 60° B. The final mother liquor is treated with hydrochloric acid and evaporated down until the zinc chloride solidifies.—Journ. Chem. Soc., lxx., 517.

BROMINE.

Hydrobromic Acid—Practical Limit of Concentration.—Charles T. Tyrer says that complaints have occasionally been made that concentrated hydrobromic acid, of s. g. 1.275 and upwards, has an odor somewhat similar to sulphurous acid, but careful examination of such acid for sulphur compounds has been attended with negative results, notwithstanding that its odor remarkably resembled sulphurous acid. Acids of 1.150 s. g. are very liable to coloration, and above 1.300 are almost certain to be colored in a few days; but these on dilution, even when highly colored and of s. g.

1.500, will often be water-white on dilution. Concentrated hydrobromic acid 1.250 and upwards attacks glass rapidly; but the silica, when once dissolved, is not thrown out readily on dilution to the B. P. strength. The sp. gr. 1.250 seems, therefore, in the author's experience, the highest practical limit of concentration; acids of higher gravity rapidly changing color and containing silica.—Yearbook of Pharm., 1896, 296–297.

Sodium Bromide—B. P. Requirement and Hygroscopy.—M. Conroy calls attention to the difficulty of obtaining from the makers sodium bromide of the official (B. P.) standard of purity; the test, applied to the *dry* salt, requiring 98.88 per cent. of true sodium bromide. The author, therefore, made some experiments in reference to its hygroscopic nature, and found that when sodium bromide is carefully dried it reabsorbed from 2 to 5 per cent. of moisture when kept in stock in a bunged jar under ordinary conditions, whilst some that had been kept in an ordinary shop bottle for some months lost 10 per cent. on drying at 212° F. It is therefore necessary in testing this article to observe that the pharmacopœial requirement of strength is on the dry salt, the word "dry" evidently having been inserted in the Pharmacopœia with a full knowledge of the hygroscopic nature of the salt.—Pharm. Jour., Nov. 28, 1896, 473; from Proc. Liverpool Chem. Assoc., Nov. 19, 1896.

Ferrum Bromatum—Method of Preparation.—The "Südd. Ap.-Ztg." recommends the following formula for preparing ferrous bromide in a dry condition: 10 p. of bromine, 5 p. of powdered iron and 45 p. of water are allowed to react upon each other in a glass flask, the iron being added very gradually and the flask kept cool to prevent violent reaction. When the solution has become pale green, it is filtered, evaporated, the residual salt powdered, and exposed to the sunlight until it has assumed a whitish color. Ztschr. Oest. Apoth. Ver., Sept. 20, 1896, 712.

IODINE.

Iodine—Import of its Presence in Water.—Prof. Lecco observes that in researches dating back to 40 years ago, and beyond, it was stated that almost every water contained iodine, as also the air, the earth, and the majority of animal and vegetable substances. Subsequent authorities have been unable to show the presence of iodine in air, water, etc. This discrepancy may be explained either by assuming that the reagents used were not always sufficiently pure, or that some of the methods used for the detection of iodine are defective. The reaction for iodine with nitrous acid and carbon disulphide is so sensitive that those quantities of iodine which occur, *e. g.*, in iodiferous salt springs, are easily detected. In mineral waters, which contain per litre only 0.1 Mgm. iodine, it is almost always possible to detect the iodine directly and determine it colormetrically without previous concentration. The author then gives an account of the Belgrade drinking waters, which are chiefly bad. In the good

waters it was fairly easy to recognize iodine, but of the twelve town wells examined, which yield bad water, traces of iodine—scarcely perceptible—were recognized in one only. Hence the question arises whether the direct recognition of iodine in water does not bear some relation to other constituents of water, which possibly interfere with the ready detection of iodine in bad waters. The author's results show that iodine is more generally diffused than is ordinarily assumed. He intends to continue his experiments on the occurrence and the detection of iodine.—Chem. News, Oct. 9, 1896, 186; from Ztschr. Anal. Chem., 1896, Part 3.

Iodine—Observations on its Occurrence in the Animal Organism.—Dr. W. D. Halliburton, referring to Baumann's discovery of thyro-iodine (see Proceedings 1896, 496), points out that iodine has been shown by Drechsel to occur in other structures than the thyroid. The substance "gorgonin," for example, of the horny skeleton of *Gorgonia Cavolinii*, contains iodine in organic combination. It is a proteid, and yields in decomposition with hydrochloric acid, leucine, tyrosine, lysine, lysatine (?), *iodogorgonic acid*, and ammonia. The main practical question involved in the discovery of iodine in the glands of human individuals—*i. e.*, whether it is an essential constituent of the healthy thyroid—is unsettled as yet, but as a point of scientific interest, Dr. Halliburton considers the discovery to be one of the most startling of recent years in the domain of chemical physiology.—Pharm. Journ., Aug. 22, 1896, 169; from "Science Progress," Aug., 1896.

Iodine—Recovery from Waste-Residnes.—In carrying out certain chemical reactions, such as the examination of fats by Hübl's method, etc., considerable quantities of iodine are consumed in analytical laboratories. Dieterich proposes the following method for the recovery of the iodine from the residues of these operations, which consist of solutions of iodine in chloroform, corrosive sublimate, hydrochloric acid, iodine trichloride, sodium tetrathionate, sodium iodide, fatty matter, etc. This is placed in a porcelain dish and the volatile solvents driven off by evaporation, after having previously made the mixture strongly alkaline by the addition of caustic potassa solution. The residue is heated at 100° C. until dry, when it is extracted with water, whereby the mercury remains behind as insoluble black sulfide, and the iodides, chlorides, traces of iron and the saponified fats go into solution. This solution is then concentrated by evaporation, allowed to cool, and the aqueous fluid poured off from the solidified soap, washing with cold water. To this solution ferric chloride is added until no more precipitation of iodine takes place. The mixture is allowed to stand for a day, when the precipitated iodine is washed, by decantation, with distilled water until free from chlorides, after which it is transferred to porous tiles for drying.—Pharm. Era, July 30, 1896, 139; from Pharm. Centralh.

Iodine—New Volumetric Determination.—Prof. E. Riegler recommends a new volumetric method for the determination of the soluble compounds of iodine, which is dependent on the liberation of iodine in the iodides by iodic acid (HIO_3), solution in petroleum ether, determination of the excess of iodic acid by titration with a decinormal solution of sodium thiosulphate, and, from the quantity of iodic acid consumed, calculating the quantity of iodine corresponding to the iodide. By means of two decinormal solutions—iodic acid, containg 17.6 Gms., and crystallized sodium thiosulphate, containing 24.8 Gms. in the liter—the author carries out the examination as follows: A known number of Cc. of the iodide solution—which must not be more concentrated than 1 per cent.—are placed into a separating funnel provided with a ground-glass stopper; an equal number of Cc. of the decinormal iodic acid solution being added, the mixture is well shaken; then add 20 Cc. of petroleum ether, into which the greater part of the liberated iodine passes after vigorous agitation; after about a quarter of an hour the liquid below the stratum of petroleum ether is allowed to run into a beaker by opening the glass cock. The solution of petroleum ether is poured away out of the separating funnel, into which the liquid from the beaker is again introduced with about 15 Cc. of pure petroleum ether, which after vigorous shaking will take up the last residues from the liquid. The aqueous solution is now passed from the separating funnel into a small flask by opening the glass cock, and, after the addition of a little starch solution, the excess of iodic acid is titrated back by means of the decinormal thiosulphate solution. The number of Cc. of decinormal thiosulphate solution which show the excess of iodic acid are deducted from that of the decinormal iodic acid solution employed. The difference thus obtained, multiplied by the factor $0.0127 \times \frac{5}{6} = 0.0106$, gives as product the quantity of iodine corresponding to the decomposed iodide. If the quantity of iodine found in this manner is multiplied by the factor 1.368, we find it expressed as potassium iodide; if multiplied by 1.1811, we obtain it as sodium iodide.—Chem. News, July 31, 1896, 52; from Zeit. Analyt. Chemie, xxxv., p. 305.

Iodine—Detection of Traces in Presence of Bromine and Chlorine.—Ludwig finds that aldehyde containing ozone liberates iodine from its combinations, so that when that liquid is distilled in the air it gives a very apparent coloration with a solution of iodide of potassium; but when distilled in an atmosphere of CO_2, no such color is produced. This aldehyde distilled in the air may be used to detect iodides in the presence of a great excess of chloride or of bromides, and is sufficiently delicate to reveal 1 in 50,000. The iodine is indicated by means of starch solution or by dissolving out with carbon disulphide.—Pharm. Journ., Dec. 5, 1896; from Annales de Chim. Analyt., i., 420.

Potassium Iodide—Permanent Solution.—Calling attention to the well-known fact that *pure* potassium iodide solutions readily become discolored,

while those prepared from potassium iodide contaminated with free alkali are comparatively stable, T. Carles recommends the addition of a small quantity of sodium thiosulphate (0.02 to 0.05 Gm. to 10 Gms. KI), which does not in any way interfere with the tests or efficiency of pure potassium iodide solutions, and possesses the advantage over free alkali that it does not decompose salts of the metals, or occasion discolored solutions with fruit syrups, tannin, etc.—Zeitschr. Oest. Apoth. Ver., Jan. 20, 1897, 52; from Bull. Soc. Pharm. de Bordeaux.

Fr. Eschbaum and J. Knobloch, referring to the above recommendation of Carles, observe that the addition of sodium thiosulphate to solutions of potassium iodide is unwarranted, on account of the free sulphurous acid liberated by the acid gastric juice in the stomach, as well as because the physiological effects of the thiosulphate are not sufficiently well known to sanction its addition. Dr. Eschbaum says that no addition of thiosulphate, or any other chemical, is necessary to perfectly preserve potassium iodide solution, if care is taken to use a distilled water that has been distilled from glass or a zinc-lined iron kettle, and *not* from copper. From experiments he has come to the conclusion that water, when distilled from copper vessels, carries over minute traces of copper in the form of oxide, and that these traces possess powerful oxidizing properties, and that to them is due the decomposition of the iodide with the liberation of iodine. —Ibid., March 15, 1897, 178; from Pharm. Ztg., 1897, 77–78.

Hydriodic Acid—Decomposition by Sunlight.—Max Bodenstein states that hydriodic acid gas is wholly decomposed on prolonged exposure to the sunlight. The intensity of the light remaining constant, the quantity decomposed in unit time is simply proportional to the quantity of undecomposed hydriodic acid present, and is not affected by its pressure (within the limits 0.5 and 1 atmosphere approximately). These are the characteristics of a mono-molecular reaction, and it therefore follows that each molecule of hydriodic acid is decomposed independently, each ray of light, of proper vibration frequency, simply breaking up the hydriodic acid molecules in its path.—Merck's Rep., May 1, 1897, 281; from Nature, No. 1426, 401.

Hypo-iodous Acid and Compounds—Formation, Characters, etc.—R. L. Taylor, by his experiments upon hypoiodous acid, has confirmed and extended the observations of Schönbein upon this compound. Using, as did Schönbein, an aqueous solution of iodine, he finds that when a little alkali is added, there is practically no iodate formed, from 90 to 95 per cent. of the iodine undergoing the reaction represented by the equation— $2\,KOH + I_2 = KI + KOI + H_2O$. The solution bleaches indigo much more rapidly than chlorine or hypochlorites, but does not bleach litmus. It gives a precipitate with cobalt nitrate which blackens on standing, and an immediate brown precipitate with manganous salts and lead salts. Stronger solutions are obtained by using iodine water containing a little

suspended iodine. All the solutions are decomposed completely by boiling for three or four minutes. The author concludes that the reaction represented above, as Walker and Ray have also recently stated, is a balanced one. He has repeated Lunge and Schoch's experiments, who obtained, by the action of iodine upon lime in presence of comparatively little water, a bleaching liquid which stood being boiled for hours without being decomposed. He concludes that their observations were practically only correct so far as they agreed with those of Schönbein. The author has also investigated the action of precipitated mercuric oxide upon iodine water, and find that hypoiodous acid is formed. The filtered (colorless) solution possesses only the feeblest possible bleaching properties, but the addition of a little alkali transforms it at once into as strong a bleaching solution as Schönbein's, and which it now exactly resembles. By the methods mentioned above, it is found that from 40 to 45 per cent. out of a possible 50 per cent. of the iodine used exists in the solution as hypoiodous acid. By using iodine water and a little suspended iodine, a stronger solution is obtained, which very soon decomposes, turning brown, owing to the liberation of iodine.—Chem. News, Feb. 26, 1897, 97.

FLUORINE.

Fluorine—Liquefaction, Characters, etc.—H. Moissan and J. Dewar describe the apparatus and method whereby they have succeeded in liquefying fluorine in the laboratories of the Royal Institution of Great Britain during the month of May. The experiments mainly owed their success to the unrivaled appliances for the production of intense cold possessed by the institution, and the skill and experience of Professor Dewar and his assistants in preparing a special apparatus suitable for the examination of, and experimenting with, fluid fluorine, and in the manipulation of large quantities of liquid air. According to this experiment, fluorine became liquid at —185°. So long as it is retained in liquid oxygen—boiling quietly at —183°—it constitutes a clear yellow liquid, possessed of great mobility, the color being the same as that of fluorine gas when examined in a stratum one meter thick. At this low temperature, fluorine has lost its chemical activity, and no longer attacks the glass in which the liquefaction is made to take place; but as soon as the little apparatus is removed from the liquid oxygen the temperature rises, and the yellow liquid begins to boil with an abundant disengagement of gas, having all the energetic action of fluorine. The authors took advantage of these experiments to study some of the reactions of fluorine on bodies kept at extremely low temperature.

Silicon, boron, carbon, sulphur, phosphorus and reduced iron, cooled in liquid oxygen and then placed in an atmosphere of fluorine, did not become incandescent. At this low temperature fluorine did not displace iodine from iodides. However, its chemical energy is still sufficiently

great to decompose benzene and essence of turpentine with incandescence, as soon as their temperatures rose to —180°. It would thus seem that the powerful affinity of fluorine for hydrogen is the last to disappear.—Chem. News, June 11, 1897, 277; from Compt. rend., 1897, No. 22, 1202.

SULPHUR.

Potassa Sulphurata—Cause of Variability.—At the meeting of the Brit. Pharm. Conference (1896) W. Elborne called attention to the fact that when pure potassium carbonate or a fairly pure commercial carbonate (say of 91.0 per cent. K_2CO_3) is used for the preparation of potassa sulphurata, the product, even when kept some months, does not appear to correspond so well with the B. P. character and tests as does the product obtained from a carbonate far less pure, say one containing 13 to 14 per cent. sodium carbonate and about 8 per cent. of mixed sulphates and chlorides. The lumps will appear dull yellow or greenish-yellow, the fracture orange-brown, and it will dissolve in water to form a clear solution; whereas the product obtained from the impure carbonate has the official green or dark green color externally and liver brown fracture when recently broken, while the solution in water is turbid and very dark colored. The purer kind of sulphurated potash, yielding directly a bright solution, is the kind preferred by both patients and bath attendants. The pharmacopœial requirement that the amount soluble in rectified spirit (1 in 30) might therefore well be restored to 75 per cent., and in the official process the direction should be given to prepare the compound from dried commercial carbonate containing not less than 90 per cent. K_2CO_3; such a carbonate being easily found in the market, as shown by the author's analysis of commercial samples in a table accompanying his paper.—Yearbook of Pharm., 1896, 331–333.

Sodium Sulphite—Commercial Quality.—Prof. Wm. Puckner reports the results of the examination of four commercial specimens of sodium sulphite under his supervision by students of the University of Illinois School of Pharmacy, with the following results: Only one of the specimens approached the official requirement. The only impurity found in any of them was sodium sulphate, which, calculated as anhydrous salt, was present in the following percentages: 2.45, 14.52, 17.5 and 20.31 per cent.—the percentage of sulphite being correspondingly less in the samples, viz., 92.52, 74.02, 66.55 and 53.91 per cent.

Sodium Bisulphite was likewise examined in three samples, all of them being unsatisfactory, being both impure, and deficient in bisulphite.—West. Drug., March, 1897, 254.

SELENIUM.

Selenium Monoxide—Question of Existence.—It was Berzelius' idea that the odor of decayed cabbage, which is noticed when selenium is burned in

air, is due to the formation of a gaseous lower oxide of selenium, which he called the monoxide. The same oxide is also said to be formed under other conditions, but it has been a generally accepted opinion of late that selenium monoxide does not exist. More recently, however, Chabrié has been led to the idea that the monoxide does exist, and that it is a solid body, and he has published the experiments and data upon which he founded his opinion. This has led A. W. Pierce to repeat the experiments of Chabrié, and supplement them with others which he now describes in detail. As the result of his investigation he has been unable to find evidence of the existence of selenium monoxide, either gaseous or solid, and his experience tends to show that the peculiar smell attributed by Berzelius to the monoxide is only developed, as already mentioned by Sace, when selenium is heated in presence of moisture, and that a mere trace of moisture is sufficient to produce the odor. According to Sace, selenium hydride is formed under these conditions, a very minute trace of which is sufficient to develop a very considerable odor.—Chem. News, Oct. 23, 1896, 200–202.

PHOSPHORUS.

Phosphorus—Preparation by Electricity.—Joudrain prepares phosphorus by heating tricalcium orthophosphate with carbon in an electric furnace similar to that in which calcium carbide is prepared. The reaction which takes place is supposed to be expressed by the following equation: $(PO_4)_2Ca_3 + 14\ C = P_2 + 3CaC_2 + 8CO$. The vapors of phosphorus pass off with the escaping carbon monoxide and are condensed. The output of phosphorus is stated to be 80 per cent. of the theoretical yield, and calcium carbide is obtained as a by-product.—Pharm. Rev., April, 1897, 76; from Jour. de Pharm. et de Chim., 1897, 3.

New Phosphorus Oxide—Formation and Character.—Besson states that a new phosphorus oxide—P_2O—is formed when phosphoretted hydrogen is passed into phosphoryl chloride containing a little hydrobromic acid, and heated to 50° on a water bath; or if the phosphoryl chloride is replaced by certain bromo derivatives of that body; or, again, if PH_4Br be heated to 50° in a sealed tube with $POCl_3$. In either case the product of reaction is again heated in sealed tubes with more $POCl_3$; after filtration *in vacuo*, it is extracted with boiling CS_2 to remove adherent $POCl_3$, then washed with boiling water and dried *in vacuo*, at first over sulphuric acid in the cold and finally at 100°. So purified it is a very light pulverulent body, reddish-yellow in color, stable *in vacuo* at 100°, but towards 135° it loses a notable portion of its oxygen. It burns when lighted in air, and reacts with concentrated nitric acid like phosphorus itself. It might be regarded as the anhydride of hypophosphorous acid; although, when heated to 100° in a sealed tube with water for twenty-four hours, no formation of hypophosphorous acid takes place, only a trace of phosphorous

acid derived from the oxygen of the air contained in the tube is found. If the temperature be raised to 130°–140°, there is still a little phosphorous acid formed even in a vacuous tube, but the atmosphere of the tube contains phosphoretted hydrogen; this would indicate that the new body is not phosphorous anhydride, its position being apparently analogous to that of nitrous oxide.—Pharm. Jour., May 1, 1897, 368; from Compt. Rend., cxxiv, 763.

Hypophosphorous Acid—Use for Determining Bismuth in Presence of Other Metals.—See under "Bismuth."

Hypophosphorous Acid—Method of Preparation.—Charles T. Tyrer, in a paper read before the Brit. Pharm. Conference, reviews and comments on a number of the processes for the preparation of hypophosphorous acid. He prefers the acid made by careful decomposition of barium hypophosphite with dilute sulphuric acid. It can be made to contain 30 per cent. of real acid; such an acid has the sp. gr. 1.137, and does not deposit on long standing.—Yearbook of Pharm., 1896, 298–299.

Meta-phosphoric Acid—Study of its Hydration.—Berthelot and André have found that sodic meta-phosphates prepared—(1) by heating monosodic phosphate to 280°; (2) by melting this salt at a red heat—behave very differently in dilute solutions. The acid titration of the first salt, done immediately after its solution, and again after the lapse of a variable number of days, indicates the presence of a considerable quantity of a mixture of ortho- and pyro-phosphoric acids, while an acetic magnesia mixture produces, when warmed, an abundant precipitate of ammonia-magnesic pyrophosphate, representing 80 per cent. of the total phosphorus present. The acid titration of the second salt, on the contrary, indicates that, under the same conditions, the formation of ortho- and pyro-phosphoric acids is much slower; the precipitate only representing 50 per cent. of the total phosphorus. The free acids prepared by means of these salts confirm these results.—Chem. News, May 28, 1897, 263; from Bull. Soc. Chim. de Paris, 1897, No. 8.

BORON.

Boric Acid—Study of its Characters and Compounds.—Louis Kahlenberg and Oswald Schreiner report on an investigation of boric acid and its salts by physical chemical methods. The investigation throws considerable light upon the complex character of the acid and its salts, as they have found that only one boric acid exists in solution. The results are briefly these:

1. In aqueous solutions there exists only one boric acid, H_3BO_3, which is formed immediately when its anhydride or partial anhydride is dissolved in water.

2. A solution of crystallized borax is the same as a solution of the equivalent quantities of boric acid and sodium hydrate.

3. In concentrated solutions of borax there exist Na ions and anions containing two boron atoms and not four, as had hitherto been assumed. These anions are split up hydrolytically, so that in dilute solutions there exist Na ions and anions containing only one boron atom, besides nearly undissociated boric acid.

4. A solution of sodium metaborate is the same as a solution of the equivalent quantities of boric acid and sodium hydrate, or of borax and sodium hydrate. This solution contains but a slight amount of hydroxyl ions, and the salt is therefore but slightly decomposed hydrolytically by water. No further combination takes place when more than 1 mol. of sodium hydrate to 1 mol. of boric acid is added, as nearly the entire excess of hydroxyl ions was found.

The authors also report the results of their investigations of the

Compounds of Borates and Polyhydric Alcohols.—The reactions involved in these combinations have been the subject of numerous investigations since 1841, but a satisfactory investigation has hitherto been impossible. By applying the newer physical-chemical methods to this problem the authors have succeeded in throwing a ray of light upon this troublesome problem. Mannit was thoroughly investigated, while erythrit, glycerol and dulcol were investigated only so far as to show that they produced the same general effect. The result is very briefly as follows:

1. Mannit combines with boric acid to form a complex boromannitic acid, which, being a stronger acid, is more readily dissociated and gives rise to hydrogen ions and boro mannitic anions. These anions are broken up hydrolytically by dilution with water.

2. Mannit combines with borax to form the acid sodium salt of the complex boromannitic acid. In such a solution there are present Na ions, H ions and anions containing two boron atoms combined with two mol. of mannit. These complex anions are hydrolytically split up by dilution with water.

3. In solution of sodium monoborate the same reaction takes place except that no hydrogen ions can be formed. There are present in solution Na ions and anions containing two boron atoms and two mol. of mannit.

4. The compounds formed by the other polyhydric alcohols are similar to that of mannit. The compound formed with erythrit is not so stable as that of mannit, but more so than either glycerin or glycol, the latter being the least stable.—Pharm. Rev., Dec., 1896, 276; from Zeitsch. f. Phys. Chem., *20*, 547.

Boric Acid—Remarkable Volatility from its Alcoholic Solution.—Dr. Schneider has observed that boric acid exhibits an astounding volatility when in alcoholic solution. If a basin containing such a solution be covered with a glass plate and allowed to stand at the ordinary temperature during twenty-four hours, a distinct white coating of boric acid will be deposited upon the glass plate. This observation has led the author to

prove the presence of boric acid in a substance by treating it with alcohol and sulphuric acid in a test tube closed with a cork bearing a glass tube bent at right angles. Upon heating, the alcohol vapor carries with it the boric acid, and when ignited at the extremity of the tube burns with a green flame. The method is applicable to the determination of the acid quantitatively by distillation; but it is advisable for this purpose to first extract the boric acid with absolute alcohol in an extraction apparatus provided with a reflux condenser, and then to distil the filtrate.—Ztschr. Oest. Apoth. Ver., Oct. 20, 1896, 791; from "Südd. Ap. Ztg."

Sodium Tetra-borate—Preparation.—The "Südd. Ap. Ztg." gives the following formula and process for preparing sodium tetra-borate: 1.9 p. borax and 0.6 p. boric acid are carefully pulverized together and heated with 0.1 p. of water in a porcelain capsule on a water-bath. By continued stirring the mass soon melts, and is then allowed to cool. When dry it is broken into fragments.—Ztschr. Oest. Ap. Ver., Sept. 20, 1896, 712.

CARBON.

Calcium Carbide—Yield as a By-Product in the Preparation of Phosphorus by Electricity.—See under "Phosphorus."

Calcium Carbide—Use as a Reducing Agent.—H. N. Warren has found in calcium carbide an excellent reducing agent for metals. An excess of litharge heated to redness in contact with the carbide, in a clay crucible, resulted under vivid incandescence in the formation of metallic lead and calcium oxide. By varying the proportions, so that the proportion of carbide exceeded that of litharge, alloys of calcium and lead were formed, which are all more or less brittle, and to a certain extent sonorous when struck, their melting point ranking below that of pure lead. They are, however, slowly, but completely, decomposed in contact with aqueous vapor. Similarly the oxide of manganese, nickel, cobalt, and even chromium, molybdenum, and tungsten, were readily reduced, yielding calcium alloys. The partial success of these and other reactions seems to point most conclusively toward calcium carbide as a new and powerful reducing agent, which, at the same time, considering the market value of the carbide, cannot fail to replace both sodium and potassium.—Chem. News, Jan. 1, 1897, 2.

Calcium Carbide—Use for Incandescent Lamps.—According to "Electro-Chem. Anz.," calcium carbide can be used for making the filaments used in incandescent lamps. The light obtained by their use is said to be very brilliant, and intermediate in power between the arc and incandescent electric lights.—Merck's Rep., Feb. 15, 1897, 120.

Iron Carbide—Formation in the Electric Furnace.—H. Moissan finds that when pure iron and the carbon of sugar are heated in the electric furnace below 3000°, it contains percentages of carbon which are indefinite

and vary with the temperature. But when the iron is saturated with carbon at 3000° and cooled abruptly in water, it shows signs of abundant crystallization, and contains a definite crystalline carbide, Fe_3C. The formation of this carbide has been observed in the liquid metal only.—Pharm. Jour., May 1, 1897, 367; from Compt. Rend., cxxiv., 716.

Carbon Tetrachloride—Value as a Cleansing Agent.—It is stated in "Neueste Erfind. u. Erfahr," that by reason of its solvent action on tar, grease, paraffin, stearin, etc., and the uninflammable nature of its vapor, tetrachloride of carbon is well calculated to replace petroleum as a cleansing agent. It may be used combined with petroleum, the inflammability of which it materially lessens. The tetrachloride also combines with alcohol, ether, oils and soaps. It combines with benzene soaps, and may, by suitable treatment, be invested with considerable washing power; this effect is increased by the addition of ammonium chloride. In removing grease spots, carbon tetrachloride is preferable to petroleum spirit, since it does not leave marks round the edges of the greasy places. It appears to be without action on the color of fabrics dyed with aniline dyes.—Journ. Soc. Chem. Ind., xv., 589.

Carbonic Oxide—New Reaction.—A. Mermet finds that air containing $\frac{1}{500}$ to $\frac{1}{5000}$ of carbonic oxide will decolorize a weak solution of potassium permanganate acidulated with nitric acid. The action is accelerated by the addition of silver nitrate, the time varying from 1 hour to 24 hours. The strengths of the solutions used to demonstrate this new reaction are—2 or 3 Gms. of silver nitrate in 1 litre of water; the potassium permanganate is prepared by boiling a litre of distilled water containing a few drops of nitric acid (free from HCl), then adding a strong solution of permanganate drop by drop until the rose color is persistent; this is to destroy what organic matter may be present. On cooling dissolve 1 Gm. of crystallized potassium permanganate and add 50 Cc. of pure nitric acid, and keep in the dark. To perform the experiment 20 Cc. of the silver solution is mixed with 1 Cc. of the permanganate and 1 Cc. of pure nitric acid, and made up to 50 Cc. with distilled water free from organic matter. On passing air which has been cleansed by first being passed through a tube containing cotton-wool, another containing phosphoric anhydride, another containing baryta water, etc., through this liquid, the decoloration is complete.—Chem. News, June 4, 1897, 276; from Bull. Soc. Chim. de Prin., 1897, No. 9.

Carbonic Acid—Utility of the Compressed Gas.—S. H. Hill, in reply to a query on the advantages and disadvantages of using compressed carbonic acid gas for the manufacture of soda water, states that up to a year ago he thought soda water could not be made without a generator. To-day he would not dispense with the "gas" for any generator. The compressed gas is clean, effectual and safe, and costs about the same as charging from

a generator. As to time, the "gas" is far ahead.—Proc. Penna. Pharm. Assoc., 1896, 121.

Carbonic Acid Gas—Relation of Heat to Pressure in its Solutions:—It is stated in "Sc. Am. Suppl." that when a beverage charged with carbonic acid gas is subjected to the action of heat, the increase of pressure due to the rise of temperature will depend on various conditions. Water at a temperature of 50° F. absorbs its own volume of carbonic acid gas; in other words, if we suppose a bottle charged with carbonic acid gas only at a pressure of 70 lbs., it will add nothing to the pressure to fill the bottle with water at 50° F., as the water will absorb the entire amount of gas. The reason this condition is not attained in practice is because of the presence of more or less air in the bottle, air being considerably less soluble in water than in carbonic acid gas.—Merck's Rep., June 15, 1897, 381.

CYANOGEN COMPOUNDS.

Hydrocyanic Acid—Qualitative Determination.—According to Deniges the presence of hydrocyanic acid may be determined qualitatively by means of a reagent made by mixing 2 Cc. of ammonia, 1 drop of a 5 to 10 per cent. potassium-iodide solution, 20 Cc. of distilled water, and 1 drop of a 1.5 to 2 per cent. silver-nitrate solution. This forms an opalescent fluid, due to the presence of silver iodide, and is used as follows: A few cubic centimeters of the article to be examined are placed in a test tube with a little zinc and 15 to 20 drops of sulphuric acid, and a glass rod, moistened with potassa solution, is held in the space over the liquid. Any hydrocyanic acid present will be carried along by the hydrogen liberated and be absorbed by the potassa on the glass rod, thereby being converted into potassium cyanide. If the rod is now dipped into the reagent, the suspended silver iodide is dissolved, and a clear solution results in place of the opalescence. When sulphides are present they are best first decomposed by mercuric chloride, the mercuric sulphide filtered off, and the test then carried out as above, the excess of mercuric chloride being no impediment to the reaction.—Pharm. Ztg., 1897, 157.

Potassium Cyanide—Morphine as an antidote.—Dr. L. Heim reports the results of experiments upon a dog and upon mice which proved beyond doubt that by the prompt injection of morphine these animals could be saved from an otherwise sure death from poisoning by potassium cyanide; or, at least, in most cases, death could be greatly delayed. The authors believe that this favorable action is due to the fact that potassium cyanide and morphine in the presence of iron of the blood form oxydimorphine and Prussian blue, both of which are comparatively harmless. Reciprocally, the potassium cyanide may serve as an antidote to poisoning by morphine.—Pharm. Rev., March 1897, 55; from Münch. Med. Wochenschr., 1896, No. 37.

Prussian Blue—Formation in a Mixture.—F. Miehle makes the interesting observation that in a prescription recently compounded, calling for 15 Gm. of ethereal tincture of ferric-chloride, 4 Gm. of Fowler's solution, and 11 Gm. of bitter-almond water, an emerald-green liquid was obtained, due to the formation of Prussian blue, which, dissolving, gave the green color on combination with the yellow of the excess of the iron tincture present. Experiments showed that this color was not obtained when the articles were mixed in the order named, but only when otherwise. He states that the coloration is due to potassium carbonate, to which the usually strong alkalinity of the Fowler's solution is due, together with hydrocyanic acid (from the bitter-almond water), reacting on the iron tincture, which usually contains ferric and ferrous salts, thus furnishing all the substances necessary for the formation of Prussian blue.—Merck's Rep., April 15, 1897, 244; from Apoth. Ztg., xii., 177.

Double Cyanide of Zinc and Mercury—Solubility, etc.—A case of mercurialism, resulting from the use of cyanide gauze as a dressing, having been reported by Dr. W. Thelwall Thomas, Prosper H. Marsden undertook some experiments to determine the solubility of the double cyanide of zinc and mercury employed in the preparation of the gauze. This double cyanide, according to Prof. Wyndham R. Dunstan, consists of about 30 per cent. of mercuric cyanide occluded in zinc cyanide. Various solvents were tried, such as water at the normal temperature and heated, borax solution, solution of carbolic acid, etc., and it was found that the compound was soluble to some extent in all of these solvents, and particularly in solution of borax. Thus, a solution of borax, 1 Gm. to 30 Cc. of water, on digestion at 180° F. with 1 Gm. of the double cyanide, dissolved from 25 to 27 per cent. When 1 Gm. of the cyanide was digested for two hours at 170° F. with 100 Cc. of a carbolic lotion (1 in 20), the loss in weight was 10.9 per cent., while the same quantity of cyanide digested in 100 Cc. of water at 60° F. lost 4 per cent., and when digested at 170° F. it lost 6.8 per cent. The results are given in a table accompanying Mr. Marsden's paper.—Pharm. Jour., Oct. 31, 282–285.

POTASSIUM.

Potassium—New and Accurate Method of Estimation.—H. N. Warren recommends the following method for the estimation of potassium, which, with a little practice, will be found more expeditious, more accurate, and at the same time less troublesome, than the general methods advised: The solution containing the alkalies as chlorides, having been previously exhausted of the accompanying group metals, is heated with an excess of platinic chloride, and the whole evaporated to very small bulk in a platinum dish, or other suitable receptacle; to the contents are now added about double the original quantity of a mixture composed of equal parts of amylic alcohol and ether. The precipitate is by these means immedi-

ately rendered dense, and can thus be washed once or twice with the utmost facility, using the same mixture. The yellow precipitate thus obtained is next transferred to a small glass beaker, and heated to the boiling point with the addition of about 5 Cc. of formic acid. The solution thus speedily assumes a brownish tint, at which stage a slight excess of ammonia is introduced, and re-boiled, when the whole of the platinum is precipitated in the form of black flocks, which may be readily washed and dried, from the weight of which the percentage of potassium present may be readily calculated.—Chem. News, May 28, 1897, 255.

Potassium—Qualitative and Quantitative Separation from Sodium.—Kreider proposes the following method for separating sodium and potassium from each other: He treats a mixture of the perchlorate of these alkalies with 97 per cent. alcohol, in which the potassium salt is insoluble, and the sodium salt readily soluble. The sodium salt is then removed from the alcoholic solution by passing dry hydrochloric acid through it while kept cold. The presence of 0.00006 Gm. of Na_2O can be readily detected; if 0.0005 Gm. is present a granular precipitate is obtained. In the usual course of analysis, after all of the other elements have been removed, the solution is evaporated to dryness, ignited, dissolved in water, filtered and the solution is again heated on a water bath with 0.1 to 0.5 Cc. of pure perchloric acid of specific gravity 1.70, until the white vapors of perchloric acid are visible. If larger quantities of sodium are present the evaporation is repeated.—Pharm. Era, April 1, 1897, 391; from Ztschr. Anorg. Chem.

SODIUM.

Sodium Peroxide—Use as a Reagent for the Iron-Group of Metals.—S. W. Parr states that by the use of sodium peroxide he has found it possible to avoid some of the complications usually attending the separation of the metals of the iron group. He adds a small porcelain teaspoonful of the sodium peroxide to the slightly acid solution, heats this to complete decomposition, and, after all the oxygen seems to be expelled, boils for several minutes. Iron, manganese, cobalt and nickel are precipitated; aluminum, zinc and chromium remain in solution.—Journ. Amer. Chem. Soc., 1897, 341.

AMMONIUM.

Ammonium Carbonate—Commercial Quality.—Prof. Wm. Puckner reports the results of examinations of commercial samples of ammonium carbonate, carried out under his supervision by students of the School of Pharmacy of the University of Illinois. In carrying out this estimation considerable difficulty was experienced, owing to the use of the indicator directed by the Pharmacopœia. In accordance with Fresenius (Quant. Anal., 6th edit., Vol. II., 267) and Sutton (Volumetric Anal., p. 35), it was found that the delicacy of rosolic acid was sensibly affected by the

presence of carbon dioxid; and finally recourse was had to the use of litmus, adding an excess of volumetric acid, expelling the liberated carbonic acid by boiling and titrating back with standard alkali. By this method one sample was found to contain 30.59 per cent. NH_3, thus showing a partial decomposition into the acid carbonate. A second sample consisted of opaque friable lumps, and evidently had been exposed to the air for a long time. It responded favorably to all tests of purity; it contained, however, but 21.53 per cent. of NH_3, showing that it had almost completely changed to the ammonium acid carbonate, for which theory requires 21.57 per cent. of NH_3.—West. Drug., June, 1897, 253.

Ammonium Chloride—Estimation in Tablets.—Albert B. Johnson has devised a process for the estimation of ammonium chloride in compound tablets, in which it may be associated with such organic matters as licorice, etc. The ammonia is determined by distilling a weighed quantity of the powdered tablets with excess of sodium or potassium hydrate in dilute solution, collecting the distillate in a measured quantity of decinormal solution of oxalic acid, and ascertaining the quantity of ammonia by titrating the excess of acid with decinormal potassium hydrate. The chlorine is determined by subjecting the tablets to complete incineration in a combustion tube with calcium carbonate in excess. The combustion tube is broken by spirting a few drops of water on it, and the fragments and contents are washed with water and nitric acid. The filtrate and washings are completely precipitated with silver nitrate, the precipitate collected on a duplicate filter, dried completely at 130° C., weighed, and the weight of silver chloride calculated into ammonium chloride. For the details of these several operations, see Amer. Jour. Pharm., Nov. 1896, 608–609.

MAGNESIUM.

Magnesia—Commercial Quality.—Two samples of magnesia, obtained in original packages, were examined by students under the supervision of Prof. Wm. Puckner. Neither of them responded to the requirements of the U. S. P., to form a gelatinous mass within half an hour, when mixed with 15 parts of water. One of them lost 38 per cent. of its weight on ignition, the other 15.8 per cent., while the U. S. P. permits a loss of only 5 per cent.—West. Drugg., June, 1897, 253.

STRONTIUM.

Strontium—Occurrence in Plants.—Henry Trimble during the examination of a number of barks from the Botanical Gardens at Singapore, with the primary object of ascertaining the character of their tannins, obtained in the ash of one of the barks a slight precipitate of strontium, so small as to pass it as being a small quantity of calcium, which was the most abundant constituent of the ash. But the ash of other samples also yielded precipitates indicating strontium, some of them in such quantity that the pre-

cipitate could be washed thoroughly, treated with acid, and its identity established by the flame test. The samples of bark so examined were from: *Castanopsis Wallichiana*, *C. Curtisii*, *C. Javanica*, and *C. Hulettii*; *Quercus hysterix* and *Q. discocarpa*. The ash from the bark of *Quercus hysterix* was probably the richest of all, but none of them contained more than traces of strontium. A sample of our American *Castanopsis*, *C. chrysophylla*, from California, failed to show a trace of strontium. A sample of *Rhizophora*, received from Singapore, also indicated the presence of strontium, and this, as well as the observation made in the case of the foregoing samples, is the more remarkable since Dr. H. N. Ridley, of the Singapore Gardens, states that little, if any, strontium occurs in the soil of Singapore. Prof. Trimble calls attention to the paucity of information that is obtainable in works of reference concerning the occurrence of strontium in plant ashes, its presence in such being mentioned only in connection with ashes from seaweeds, and in one case, in the fungi. The observation of Messrs. Kebler and LaWall that opium sometimes contains notable quantities of strontium (see under *Opium*), may therefore be explained as being due to natural causes rather than, as suspected by them, an act of adulteration.—Amer. Jour. Pharm., June, 1897, 296–297.

Strontium Salts—Preparation.—S. O. S. Soerensen calls attention to the difficulties attending the separation of calcium, barium and strontium compounds, and gives the following method for preparing pure strontium salts: Commercial strontium carbonate is dissolved in as little hydrochloric acid as possible. Strontium hydrate is added to make the solution alkaline and chlorine is passed into it, the solution again slightly acidified with hydrochloric acid and most of the barium precipitated as barium chloride by means of the requisite amount of concentrated hydrochloric acid. Barium and strontium are now precipitated as sulphates, these are converted into the carbonates by means of ammonium carbonate, and the resulting carbonates are dissolved in nitric acid. From the solution so obtained the barium is precipitated fractionally with sulphuric acid, the filtrate is evaporated to a magma, and this is treated repeatedly with alcohol to free it from calcium nitrate. The strontium salt so obtained does not contain traces of barium or calcium, the yield being 75 per cent. of the commercial carbonate employed.—Pharm. Rev., Aug. 1896, 188; from Ztschr. Anorg. Chem., *11*, (1896), 305.

Pure Strontium Salts—Simple Process of Preparation.—H. B. Dunham, referring to the rather circumstantial and tedious process of Soerensen for the preparation of pure strontium salts, communicates the following simple and expeditious method described by him in a thesis presented to the Massachusetts College of Pharmacy: Commercial strontium nitrate is put in a porcelain dish on the coals of a hot fire. NO_2 is rapidly given off and goes up the chimney, strontium oxide remaining. This is slaked and washed (cold) by decantation until free from barium, and then dissolved

in boiling water. As the solution cools, strontium hydrate crystals form rapidly, and the yield of the pure salt is enormous. All tests fail to discover the most minute traces of impurity in this salt. The theory of the process consists in this—that strontium hydrate is soluble in 60 parts and barium hydrate in 20 parts of cold water; the latter is therefore easily washed out. Calcium hydrate is nearly insoluble in boiling water, while strontium hydrate is soluble in 2.4 parts of the same. The ease with which the calcium is separated is enhanced by the fact that its solubility increases as the solution cools. Strontium hydrate is most convenient for making the medicinal salts, and superior to the carbonate also in that, being crystalline, it is not so susceptible to adulteration.—Amer. Drug., Sept. 25, 1896, 186.

Strontium Bromide—Correction of U. S. P. Test.—Carl E. Smith observes that although the description of the strontium salts and the tests for impurities in them, as given by the Pharmacopœia, will reject any dangerously impure article, it is quite possible that a salt, while fulfilling all requirements of this authority, may still be far from pure. Thus, in the case of the bromide, the test for barium does not show the presence of much smaller quantities than 0.5 per cent. of this substance; a test for calcium, which is a very common impurity, is also absent, and the method of estimating the chloride present is apt to give misleading results, as it stands now. Concerning the test for the presence of barium, the author observes that if worded something like the following, it would show the presence of about 0.1 per cent. of barium salt:

If 2 Gm. of the salt be dissolved in 6 Cc. of water, the solution acidulated with a drop of diluted acetic acid, and then 5 drops of potassium dichromate test solution added, the solution should remain clear for at least 1 minute. The presence of calcium is indicated by the deliquescent character of the salt, pure strontium bromide being only slightly deliquescent. To detect the calcium, the following test may be directed:

Heat on a water bath for 5 minutes a mixture of 1 Gm. of the salt to be tested, 3 Gm. of ammonium sulphate, 10 Cc. of water, and a few drops of ammonia water. Then filter, and to the clear filtrate add 5 drops of ammonium oxalate test solution. If the solution become turbid at once, 1 per cent. or more of calcium salt is present; if only after 5 or 10 minutes, about 0.5 per cent. is present.

Finally, to obtain correct results by the prescribed method of estimating the amount of chlorine present, a much higher temperature for drying the strontium bromide is necessary to secure accurate results. More detailed directions as to drying would therefore be a decided advantage, as the presence of only a small amount of water will cause a large error in the calculation.—Pharm. Rev., Dec., 1896, 268–269.

Strontium Sulphide—Preparation of a Highly Phosphoresent Compound.—José R. Morelo has succeeded after many trials to obtain a highly phos-

phorescent strontium sulphide by operating as follows: He took 285 Gms. of impure commercial strontium carbonate, 62 Gms. flowers of sulphur, 4 Gms. crystalline sodium carbonate, 2.5 Gms. sodium chloride, and 0.4 Gm. bismuth subnitrate. The mixture, finely powdered, was placed in an earthen crucible, pressed down and covered with a layer of tinder in coarse powder: this stratum does not exceed 2 Cm. in depth. The crucible, set in a furnace, is heated to bright redness by a coke fire for five hours, and is then allowed to cool slowly for ten or twelve hours. The product so obtained constitutes an agglomerate, nearly white, granular and friable, possessing a phosphorescent power which the diffused light of the laboratory is sufficient to excite in the shade and behind the windows of the cupboard in which the bottle was inclosed. As observed by Verneuil, most of the strontium sulphides prepared by the author lose their phosphorescent power if powdered, but these pulverized sulphides, if mixed with tinder and heated to bright redness for five hours, resume their phosphorescent power.—Chem. News, June 18, 1897, 299; from Compt. rend., May 10, 1897.

Strontium Chromate—Formation of the Double Salts with Mercuric Chloride.—H. Imbert and G. Belugou find that strontium chromate and mercuric chloride in a hydrochloric acid solution form a double salt—$CrO_4Sr,2HgCl_{2},HCl$—which is undecomposable by water. They are also able to predict the existence of a certain number of double salts containing an excess of hydrochloric acid. In a further note on the same subject Mr. Belugou obtains analytical results which lead him to believe that a basic mercuric chromate is also formed which is mixed with the principal substance as an impurity.—Chem. News, June 4, 1897, 276; from Bull. Soc. Chim. de Paris, 1897, No. 9.

ALUMINUM.

Aluminum—Oxidation under the Influence of Mercuric Iodide.—Wm. Robertson calls attention to an evident oxidation of aluminum weights. Some drachm weights having been left on the scales for a few minutes, were found beautifully fringed on the upper edge with small white feathery crystals, which on being collected weighed two grains.—Pharm. Journ., July 11, 1896, 40.

Mr. Robertson has since explained that he had been weighing mercuric iodide, contact with which doubtless caused the chemical action, and a similar case is now described by P. A. E. Richards, who states how an aluminum spatula used to convey some mercuric iodide from a bottle to a test-tube became covered with a coating of white powder, after being wiped. Washing with water and subsequent drying of the spatula were followed in a few minutes by the appearance of a brush-like "growth," consisting of white filaments standing upright on the flat surface of the blade. "Whilst watching them they increased visibly, and resembled

somewhat the white 'hyphæ' of *Mucor mucedo*." A similar phenomenon was found to follow contact of mercury or any mercury salt with aluminum for only a minute, and it is suggested that the mercury first forms an amalgam with the aluminum, which reacts with the moisture present in the air or on the surface of the metal, forming alumina and liberating the mercury to form more amalgam. A weighed strip of aluminum, left in contact with powdered mercuric chloride for two minutes, then washed, roughly dried, and left for an hour, was found to have lost a little over eight per cent. of its original weight. These results show that the greatest care should be taken to prevent any aluminum apparatus, etc., being brought into contact with mercury in any shape or form.—Ibid., July 25, 1896; from Chem. News, lxxiv., 30.

Aluminum Amalgam—Preparation and Usefulness.—H. Wislicenus and H. Kaufman prepare aluminum amalgam as follows: Aluminum turnings, freed from oil, are treated with soda lye until a strong escape of hydrogen occurs; the surface is then rinsed with water, and treated for two minutes with a ½ per cent. solution of sublimate. These operations are repeated after a short time; the preparation is then quickly washed with water, alcohol and ether, and the product kept under petroleum ether. Being a neutral reduction agent, aluminum amalgam is very serviceable for the dehydration of alcohol, ether, etc., as it reacts for water with a formation of hydrogen and aluminum hydroxide. Aromatic nitro-compounds are reduced to amines, or, if the reaction is moderated, to substituted hydroxylamines, sodium nitrite to hydroxylamine, and even to ammonia, etc.—Chem. News, Oct. 16, 1896, 197; from Ztschr. Anal. Chem., 1896, Part 3.

Alum—Commercial Quality.—Prof. Wm. Puckner reports upon the examination of two samples of crystals and three samples of powdered alum by students under his supervision, the results being favorable to the present requirements of the U. S. P. Ammonia alum seems no longer to be on the market.—West. Drug., June, 1897, 253.

MANGANESE.

Potassium Permanganate—Preservation of Solutions.—Meinecke and Schrœder state that solutions of potassium permanganate may be kept for two months in excellent condition, for analytical purposes, by pouring a layer of the purest vaselin oil obtainable on the surface of the solution.—Pharm. Ztg., 1897, 157.

IRON.

Ferrates—Method of Preparation.—Moeser communicates the following methods for preparing various ferrates:

Potassium Ferrate (K_2FeO_4).—To a mixture of 80 to 90 grams of ferric hydrate, 80 grams of water and 50 grams of potassium hydrate, gradually

add 50 grams of bromin, keeping down the temperature by means of ice. After the reaction is complete add 20 grams more of potassium hydrate, and heat the solution for one-half hour to 100° F. Allow to cool, when the potassium ferrate, contaminated with alkali bromid and bromate, is drained out and dried by placing on porous bricks. The salt is then treated with 96 per cent. alcohol and washed with ether, and after drying it is dissolved in three parts of water. When this solution is poured into much alcohol the potassium ferrate will be precipitated as a blackish-red, slightly hygroscopic powder. This powder dissolves in water with a saturated dark color, dilute solutions being permanent for several hours, while in a concentrated form it will quickly decompose, yielding oxygen.

Sodium Ferrate.—This salt is similarly prepared and possesses properties analogous to the potassium salt.

Barium Ferrate ($BaFeO_4$) may be obtained by double decomposition between potassium ferrate and barium chlorid. It constitutes a dark-carmine amorphous powder, which is insoluble in water. In a moist condition this compound also is gradually decomposed.—West. Drug., June, 1897, 265; from Pharm. Centralh.

Ferric Chloride—Detection in Presence of Other Ferric Salts.—Pierre Aspéry observes that when a very dilute solution of ferric chloride—1 : 1100 to 4000—is boiled, it acquires on cooling a reddish-brown color, though it may originally have been colorless. This coloration is due, according to Brouardel, to the formation of colloidal ferric hydroxide; and since other ferric salts, such as the sulphate, nitrate, lactate, etc., do not give this reaction, Aspéry recommends this as a simple method of determining the presence of ferric chloride in mixtures that are known to contain iron.—Ztschr. Oest. Apoth. Ver., Oct. 10, 1896, 767; from Proc. Soc. Imp. de Med., Constantinople.

Ferrous Phosphate—Formula Proposed for the B. P.—E. J. Evans, having obtained disappointing results when operating by the formula of the B. P. for preparing ferrous phosphate, has experimented, and as a result suggests the following formula as suitable for the next B. P.: Dissolve 12 parts of iron ammonium sulphate (or 8 parts of iron sulphate) in 150 parts of distilled water, and 10 parts of sodium phosphate and 2 parts of sodium acetate in another 150 parts of distilled water; mix the solutions together in a flask closed with an air-tight cork, and of such capacity that the two solutions shall completely fill it. Shake well for some time, then set aside in a dark place for two to four days, decant the clear solution, fill the flask again with distilled water, and after (shaking, and) standing twelve hours, decant the supernatant liquid again, transfer the precipitate to a calico filter, squeeze strongly, and dry the precipitate on a water-bath heated not exceeding 100° F., stirring meanwhile with a glass rod. The resulting powder should be kept in a stoppered bottle, protected from light. It is

soluble in acids, insoluble in water, and should require $K_2Cr_2O_7$ standard solution to correspond with 90 per cent. of hydrated ferrous phosphate.—Pharm. Journ., Feb. 20, 1897, 141–142.

ZINC.

Zinc—Quantitative Determination in Organic Salts.—Gottfried von Ritter recommends the following method for the quantitative determination of zinc in organic salts, and gives instances of the accuracy of his method as applied to zinc acetate, lactate, succinate, tartrate, mucate, benzoate, and hippurate. The salt is covered with concentrated nitric acid, the acid is cautiously evaporated off, and the residue is ignited, when zinc is left behind as oxide. The excess of nitric acid must be driven off at a gentle heat, to avoid spirting, and the apparently dry residue must not be at once ignited, but merely heated a little more strongly than before. These two operations can be easily and safely executed in a Lieben muffle. The residue is then heated until white. Porcelain crucibles should be used, as platinum is strongly attacked. Experiments in which sulphuric acid was used instead of nitric acid gave results too high by several per cent.—Chem. News, Oct. 9, 1896, 186; from Ztschr. Anal. Chem., 1896, Part 3.

Zinc—Determination as Sulphide.—J. Meunier observes that all chemists who have concerned themselves with the determination of zinc know the difficulties of collecting on a filter zinc sulphide precipitated by ammonium sulphide. The filtrate is turbid and the filtration is soon stopped. He therefore suggests the following manipulation: To the solution of zinc, which is properly luke-warm, he adds ammonia, and when the precipitate of zinc oxide is formed he continues to add this reagent, but cautiously, and passing in sulphuretted hydrogen bubble by bubble, ceasing as soon as the precipitation of the zinc is complete.—Chem. News, June 25, 1897, 312; from Compt. rend., May 24, 1897.

COPPER.

Copper—Volumetric Determination.—Rupean proposes a volumetric method for determining the copper in solution, which is dependent upon the precipitation of copper by picric acid from ammoniacal solutions. The copper solution is titrated until it is green; then the copper picrate is allowed to subside and the titration is continued until the solution is yellow without a greenish tint. One Cc. of a solution, containing 7.2 Gm. of picric acid in ammonia to the liter, precipitates 1 Mg. of copper from its ammoniacal solution. The copper solution is diluted so as to contain about 1 Gm. of copper in a liter. No modification is necessary in the presence of silver or zinc besides the copper, since the picrates of both of these metals are soluble in ammonia; but in the case of lead, a little

tartaric acid must be added, because the lead picrate is soluble in the ammonium tartrate formed. In the presence of iron, this is first converted into the ferric salt, and is then precipitated out by the ammonia, when, after filtration, the copper may be titrated as before explained.—Pharm. Rev., Sept. 1896, 207; from Apoth. Ztg., 1896, 576.

Copper—Determination in Vegetable Substances.—Dr. Victor Vedrödi has made further experiments with the view to ascertaining the reason for the discrepancies obtained by him, and those of Dr. Lehmann, and others (see Proceedings 1896, 718, 719). In the first place the method followed by the author of mineralizing the vegetable substances in a muffle furnace was compared with Lehmann's method of treatment with sulphuric acid with the help of nitric acid. In both cases the copper was precipitated as sulphide, and in testing Lehmann's process the influence of silica was also ascertained. In three series of experiments it is claimed that the results show that there is a close agreement in both methods if the copper is subsequently precipitated as sulphide, and that it is immaterial whether the silica is separated or not before precipitating with sulphuretted hydrogen. Lehmann's method of mineralizing the substance is, however, much quicker than the author's, although requiring more attention during the operation. It is also possible to determine the copper colorimetrically either with ammonia, or, in in the case of small quantities of copper, with potassium ferrocyanide, with a fair degree of accuracy when dealing with pure copper solutions, or when the copper has been first precipitated as sulphide from the ashes of vegetable substances, taking *Paprica* for the purpose of experiment. When, however, as in Lehmann's method, the ash was obtained by treatment of the substance with sulphuric acid and the copper determined colorimetrically with ammonia, there was a separation of a yellowish-white and gelatinous precipitate, consisting of silica colored with iron oxide. The solution when compared with a standard copper solution, showed a considerably less amount of copper than was known to be actually present, and after a short time the precipitate had absorbed the color from the solution completely. The exact determination of copper by this method is therefore impossible, and explains the great difference between his results and Lehmann's as to the stated amount of copper in vegetable substances. The colorimetric determination of copper is therefore only to be depended upon when the copper solution is sufficiently pure, and it is absolutely necessary first to separate the silica and iron oxide that always occur in vegetable substances. The circumstance that not only Lehmann, but all other chemists, have found such a small amount of copper in vegetable substances must be ascribed to the same or to a similar source of error.—Pharm. Journ., Aug. 29, 177; from Chem. Ztg., 1896, 584.

LEAD.

Lead Peroxide—Improved Method of Manufacture.—H. N. Warren observes that lead peroxide is now largely consumed in some commercial quarters, in consequence of which various methods have been devised for its preparation. He calls attention to the difficulties encountered in carrying out these processes, and recommends the following synthetical method as giving a pure and theoretical yield, free from secondary products: In order to bring about the reaction, either litharge or sulphate of lead from vitriol tanks, etc., is introduced into canvas bags, through which is inserted a lead sheet. These bags are now immersed in dilute vitriol, and connected respectively to sheets of iron; the sulphate or other plumbic compound contained therein is thus speedily and completely reduced to the spongy metal, the bags being afterwards connected alternately by their lead plates and exposed to an electric current, the positives being thus completely converted into peroxide, whilst the temporary accumulator thus produced is again emptied of its current into further quantities of spongy metal, thus manufacturing a further quantity of peroxide. The process thus set forth, when rightly conducted, yields an absolutely pure oxide, on a cheaper scale than those hitherto recommended.—Chem. News, Sept. 18, 1896, 144.

Metaplumbates—Formation and Characters.—Several years ago M. Hoehnel reported a simple method for the purification of the unstable compound of sodium and metaplumbic acid—$PbO_3Na_2 + 4H_2O$—converted this normal salt into the acid salt—$PbO_3HNa + 3H_2O$, and prepared the stable

Calcium Metaplumbate—$PbO_3Ca + 4H_2O$. He has now with the aid of the levigated calcium salt prepared metaplumbates of the heavy metals by double decomposition with the normal acetates of the respective metals.

Zinc Metaplumbate, $PbO_3Zn + H_2O$ constitutes a brown crystalline powder.

Copper Metaplumbate, PbO_3Cu, is a dark black powder, while

Manganese Metaplumbate is a greenish-black crystalline powder. The

Lead Metaplumbate, PbO_3Pb, is identical with the sesquioxide, Pb_2O_3, of Winkelblech, and possesses the same color as that obtained by Jacquelain, who precipitated a solution of minium in glacial acetic acid with ammonia.

While the author believes that soluble salts of the heavy metals will behave like those of copper, zinc, etc., towards calcium metaplumbate, he has been unable to prepare the barium, magnesium and strontium salts in this way.—Arch. d. Pharm., 234 (1896), 397.

TIN.

Tin Chloride—Value as a Solvent for Iron-rust.—According to a communication to "Stahl und Eisen," the removal of rust from iron is easily

effected by immersing the object in a solution of tin chloride (SnCl). The length of immersion depends upon the thickness of the rust, but usually from 12 to 24 hours is sufficient. It is necessary to avoid an excess of acid in the tin solution, however, since the acid will also attack the iron. After immersion the object is well washed in water, then rinsed with ammonia, and dried rapidly.—Zeitschr. Oest. Apoth. Ver., Aug. 20, 1896, 620.

Stannous Iodide—Apparent Action of Light in Inducing Crystallization.—G. I. H. Warden, while in the Medical College, Calcutta, observed that some stannous iodide which he had prepared, acting on stannous chloride with potassium iodide, and preserved in a moist condition in a flint-glass bottle, gave evidence of the formation of ruby-red crystals on the front of the bottle exposed to the light from a window, whereas the iodide at the back and sides of the bottle retained its original amorphous condition. On pasting a piece of paper, cut in the shape of a cross, on the bottle, and, after shaking the contents, exposing the bottle with the cross towards the window, the portion of the contents not protected by the paper was coated with ruby needles, while that beneath the cross remained unchanged, and on removal of the paper revealed perfectly the shape of the cross. The author calls attention to this interesting observation, which he can only account for as being a process of crystallization induced by the action of light.—Pharm. Jour., Jan. 26, 1897, 61.

TITANIUM.

Titanium—Preparation.—H. Moissan has found that titanic acid, in the presence of carbon, can be converted into crystallized titanium oxide in the electric furnace, working with a current of 50 ampères and 50 volts, whilst with 350 ampères and 70 volts, the bronze-yellow titanium nitride, Ti_2N_3, is obtained. This, in turn, is decomposed upon increasing the current to 1200 ampères and 70 volts, titanium carbide, TiC, being formed free from nitrogen, and upon heating this carbide with excess of titanic acid, metallic titanium, containing only 2 per cent. of carbon, is obtained. It is the most refractory substance yet obtained by means of the electric furnace, being more infusible than vanadium.—Pharm. Journ., Oct. 31, 1896, 377; from Annal. de Chim. et de Phys. (7), ix., 229.

TUNGSTEN.

Tungsten—Preparation from Tungstic Acid in the Electric Furnace, Properties, etc.—H. Moissan states that tungsten can be readily obtained in the electric furnace by the reduction of tungstic acid by means of carbon, and that if the melting point of the metal is not attained, the latter can be obtained in a very pure state. Operating in the presence of excess of carbon, or in a carbon crucible, a definite carbide, Tu_2C, is obtained. This dissolves carbon, and subsequently liberates it in the form

of graphite. Platinum, rhodium, palladium, and iridium, share this property. Tungsten can be filed or forged, and case-hardened with facility. It does not affect the magnetic needle, and its melting point is higher than those of chromium and molybdenum.—Pharm. Jour., July 25, 1896, 62; Compt. rend., cxxiii., 16.

Calcium Tungstate—Preparation by the Humid Method.—The high price of calcium tungstate, which is used in the X-ray equipment, has brought out a number of directions in the various journals for its manipulation, but they are all to be performed in the dry way, and those who have but little experience in fusion methods encounter many obstacles. Prof. Chas F. Crowley has made five fluoroscopes from calcium tungstate, prepared in the wet way, and it gives fully as good results as that prepared by the more tedious dry process. He uses an excess of calcium chloride solution and adds a solution of sodium tungstate; a precipitate immediately forms, which is collected and dried on a filter in the usual way. The precipitate is very soft and feathery and is now placed, a portion at a time, in a porcelain crucible and heated to whiteness by means of a Bunsen burner supplemented by an ordinary jeweler's blow-pipe. It is not necessary to reach the fusing point. The calcium tungstate is now found to be in a coarse lumpy state. This is ground very fine in a mortar, mixed with a mucilage made of gum arabic, and applied to a screen.—Drug. Circ., Sept., 1896, 205.

Magnesium Tungstate—Properties.—Attention is called to magnesium tungstate, $Mg.WO_4$, which occurs in the form of coarse powder, consisting of brilliant, colorless crystals, insoluble in water. The substance possesses the same properties in respect to the Röntgen rays as calcium tungstate, the platino-cyanide compounds, and the alkaline earths.—Merck's Rep., March 1, 1897, 145.

VANADIUM.

Vanadium—A New Source in South America.—The "Chemist and Druggist" (Aug. 15, 1896, 277) calls attention to an important source of vanadium which has been recently discovered in an anthracite coal mine in the South American Andes at an elevation of 16,000 feet. The coal, which burns easily, leaves about 2 per cent. of ash containing from 14 to 25 per cent. of vanadium, besides some silver, and traces of zirconium and platinum. Vanadium from this source has already been used for a variety of purposes.

Ammonium Vanadate—Preparation.—John M. Tobin calls attention to some of the uses of vanadium, which is principally converted into ammonium vanadate and used in the arts, in dyeing, ink-making and photography. The chief source of vanadium is vanadate of lead, which is usually found associated with magnetic iron, gold and silver. Vanadium is found in various places throughout the United States—Phœnix, Ariz.;

Lincoln, Neb.; Texas, Mexico and Connecticut, the percentage varying from five to twenty, according to concentration of ore. The preparation of ammonium vanadate is as follows: The ore is fused with potassium nitrate and dried sodium carbonate in black-lead crucibles. After cooling it is ground very fine, washed with boiling or hot water several times, solution concentrated, and saturated with ammonium chloride (free from iron), which precipitates ammonium vanadate in very fine powder. Filter and dry at room temperature. Wood and iron vessels must be avoided, as both discolor the salt; the former from tannic acid, the latter from the iron. Further purification may be effected by repeated fusings with potassium nitrate and sodium carbonate, etc., as above, and again precipitating with ammonium chloride.—Pharm. Era, Dec. 24, 1896, 822.

Sodium Vanadate—A New Reagent for Alkaloids, which see under "Organic Chemistry."

ARSENIC.

Orpiment—Non-Toxity when Pure.—Although orpiment is generally regarded as a virulent poison, Fleury does not consider that, when pure, this is correct. He finds that commercial orpiment invariably contains free arsenous acid, which gives it toxic properties. Having prepared some pure arsenous sulphide, he administered two doses of 25 centigrammes to a medium-sized dog. No observable effect was produced on the animal when this quantity was mixed with his food. Probably in the presence of an alkali the effect would be poisonous.—Pharm. Journ., Nov. 28, 1896, 459; from Bullet. de la Soc. de Pharm. de Bourd., xxxvi, 309.

Copper Arsenite—Ready Method of Preparation.—Aug. Drescher, having occasion to make some copper arsenite (Scheele's green), made use of the well-known copper test for arsenic for its preparation, taking care to have the proper stoechiometric equilibrium established for this purpose. The reaction is as follows: $As_2O_3 + 2CuSO_4 + 3H_2O = 2(CuHAsO_3 + 2H_2SO_4)$. Some physicians seem, however, to prefer the more saturated copper arsenite, $Cu_3(AsO_3)_2$. This can be made, just like Scheele's green, by applying more copper sulphate, thus: $As_2O_3 + 3H_2O + 3CuSO_4 = Cu_3(AsO_3)_2 + 3H_2SO_4$. For the production of the Scheele's green proper ($CuHAsO_3$), a great deal of skill is required, as the liquid out of which it is to be precipitated must be critically neutral, the least excess of either acid or base acting as a direct solvent, resulting in loss of yield—Proc. N. J. Pharm. Assoc., 1896, 57–58.

Iron Arsenite—A Soluble Combination Suitable for Hypodermic Use.—T. Césaris gives the following formula for making soluble iron arsenite suitable for hypodermic injections: 4.182 Gms. of citric acid and about 200 Gms. of water are introduced into a flask provided with a cork carrying a tapering tube. After solution, 0.715 Gm. of powdered iron filings is

added, and the whole is heated on a water-bath for several hours, the evaporated water being replaced from time to time. The liquid is then neutralized by adding sodium carbonate, and mixed with a solution prepared from arsenous acid 0.1 Gm., sodium carbonate 1 Gm., and glycerin 10 Gms., after which the mixture is filtered, and evaporated on a water-bath until it measures 100 Cc. Each Cc. will represent 0.049 Gm. of iron citrate, and 0.001 arsenous acid.—Merck's Report, Sept. 1, 1897, 455; from Rép. de Pharm., vii, 319.

Lead Arsenate—Value as Insecticide and Preparation.—Frank T. Shutt states that lead arsenate has been recommended as a substitute for Paris green, over which it is said to have the superiority of greater safety with equal efficiency as an insecticide. The compound is formed by double decomposition between sodium arsenate and lead acetate. It is insoluble in water, has the composition represented by the formula $Pb_3(AsO_4)_2$, and may be prepared for the purposes of an insecticide as follows: Dissolve 3 ozs. of sodium arsenate and 4¾ ozs. of lead acetate, each separately, in a quart of water, and pour the solutions simultaneously into a barrel containing about 45 gallons of water, stirring well during the addition. Then add sufficient water to make 50 gallons of the mixture, which then represents 1 lb. of lead arsenate in 200 gallons, and contains a slight excess of lead acetate. Precipitation in a large volume of water renders the lead arsenate more voluminous and easy of suspension.—Chem. News, July 10, 1896, 17–18; from Rep. Exp. Farm Dep. Agricult., Canada.

ANTIMONY.

Antimonii Oxidum—Commercial Quality.—Charles H. LaWall calls attention to the importance of care in the purchase of antimony trioxide, which, under the designation of *Antimonii oxidum*, is official in the U. S. P., mainly for the purpose of making *Pulvis Antimonialis*. In the Pharmacopœias of 1860 and 1870 processes were given for the preparation of the oxide, but these have been omitted in the revisions of 1880 and 1890, the pharmacist depending upon the manufacturer for this product and upon the official tests for the recognition of its quality. Six samples were examined by the author by three different methods, which gave fairly concordant results. Three of the samples were made by the author: one by strictly following the process of the U. S. P., 1870, the other two from purchased solution of antimony terchloride. While the product made officially throughout, conformed in all respects with the requirement of the Pharmacopœia—containing between 82 and 83 per cent. of Sb—those from the two purchased solutions were deficient, containing only from 69 to 70 per cent. of Sb. A fourth sample, bearing the label of a well-known manufacturing firm, was satisfactory in every respect; a fifth, the ordinary commercial article used in the arts, was of satisfactory strength, but not of good appearance. Finally, the sixth sample, which was labeled "stibic

acid," consisted principally of the higher oxide of antimony, and was consequently unsuited for making antimonial powder. The author holds that pharmacists should prepare the antimonial powder themselves, and preferably from antimony trioxide prepared by the formula of the U. S. P. of 1870.—Amer. Jour. Pharm., Nov., 1896, 597–601.

BISMUTH.

Bismuth—Determination by Means of Hypophosphorous Acid.—W. Muthmann and F. Mawkrow, some time ago showed that hypophosphorous acid is suitable for the determination of copper, and especially for its separation from cadmium and zinc. They now find that under suitable precautions, bismuth may be separated as metal from its solutions by the same means, and that the method is far more accurate and expeditious than any hitherto known. It is carried out as follows: The solution of the bismuth salt, not too strongly acid, is mixed with an excess of hypophosphorous acid, and heated on the water-bath until the supernatant liquid has become perfectly clear, and a further addition of the reagent heated to ebullition produces no further coloration. The metal separates out in the form of a reddish-grey spongy mass, which can be easily filtered and washed. It is collected upon a weighed filter or in a Gooch crucible, washed with boiling water, and then with absolute alcohol, and dried at 105°. The original solution is best used in a state of moderate concentration, and a few Cc. of hypophosphorous acid are forthwith added. The method is doubtless applicable for the separation of bismuth from metals, which are not precipitated from their solutions by hypophosphorous acid.—Chem. News, Jan. 29, 1897, 50; from Ztschr. Anorg. Chem., xiii., 207.

Bismuth Subnitrate—Composition of Commercial Samples.—The recent observations of the late Dr. Curtman concerning the chemical composition of bismuth subnitrate (see Proceedings 1896) being, in some respects, at variance with results obtained by Lyman F. Kebler, he has undertaken some experiments upon the compound as supplied by reliable manufacturers, and now records his results. In order to differentiate, at the outset, between the amount of mixture mechanically retained and the per cent. of chemically combined water, a large number of experiments were necessary. These make it evident that when the salt is heated at 120° C. for 34 hours, all the mechanically contained water is expelled, and very little, if any, of that chemically combined; the crystals showing no disintegration when examined under the microscope. The figures obtained at that temperature, while not admitting of absolute conclusions, were therefore accepted as the basis of calculation for ready comparison. The bismuth oxide was determined by ignition in the usual way; the nitric acid by the following method, as being more satisfactory than either Gunning's or Curtman's: To a weighed quantity of the salt, suspended in about 10 equivalents of distilled water, an excess of normal potassium hydroxide and a few drops of

phenolphthalein solution are added; the mixture is brought to a brisk boil, and the excess of potassium hydroxide is then re-titrated. The results obtained by the author are shown in the following table:

Number of Sample.	Per cent. of Bismuth Oxide.	Per cent. of Nitric Acid Radical (NO_3).	Per cent. of $BiONO_3,H_2O$. Calculated from NO_3.
1	83.23	18.78	92.09
2	81.26	18.38	90.14
3	81.46	17.88	87.69
4	83.26	18.44	90.43
5	82.50	14.12	69.25
6	81.00	17.76	87.10
7	81.15	17.70	86.81
8	81.36	18.76	92.00
9	81.02	19.21	94.21
10	83.01	19.68	96.51

The samples were taken from original packages of the salt manufactured in Philadelphia, New York and Brooklyn. They complied with the pharmacopœial requirement in every respect, except that from an appreciable amount to a minute trace of chlorides was present in every case, and that No. 5 was contaminated with the carbonate. The results show them, with the exception of No. 5, not to be so excessively basic as those reported by Dr. Curtman.—Amer Jour. Pharm., Aug., 1896, 422–425.

Bismuth Phosphate—A Substitute for the Subnitrate.—Kauffeisen suggested that bismuth phosphate should be substituted for the subnitrate, being more stable and definite in composition, and at the same time easily prepared in the pharmacy. Dr. Tédenat now finds it to be quite as efficacious in its therapeutic properties as the subnitrate. He observes that the frequency with which samples of bismuth subnitrate develop an acid reaction, and its variable density and structure, renders it desirable that a more stable, unvariable salt should be employed, provided it be equal in efficacy.—Pharm. Journ., Nov. 7, 1896, 406; from Répert. de Pharm., (3) vii, 303.

Bismuth Oxybromide—Medicinal Advantages over Other Bismuth Compounds.—Dr. Hugh Woods has prepared and describes bismuth oxybromide as being an impalpable, very faintly yellow powder, that forms a very satisfactory emulsion with tragacanth mucilage, and has advantages over other bismuth compounds for administration in mixtures. It has been found very serviceable in cases of dyspepsia associated with nervous derangements, in hysterical conditions combined with gastric pain and vomiting, etc.—Merck's Rep., April 1, 1897, 212; from Brit. Med. Journ.

Bismuth Oxy-Iodide—Formation and Characters.—T. R. Blythe, when distilling the double iodide of methylamine and bismuth with caustic soda,

in order to obtain the methylamine, the residue after distillation proved to be almost white, a fact which the author could not understand, as the ordinary subiodide, BiOI, was expected. Analyses proved the white substance to be a new body, an oxy-iodide having the composition $Bi_{17}I_3O_{24}$. It is a light microscopically crystalline powder, having a slight brown tint, is unattacked by water or alkali, soluble in hydrochloric acid, but decomposed by nitric acid with liberation of iodine, and by sulphuretted hydrogen with formation of sulphide.—Chem. News, Oct. 23, 1896, 200.

MERCURY.

Mercury—Forensic Determination.—D. Vitali recommends the following method for the detection of mercury in cases of poisoning: After the destruction of the organic matter, according to the Fresenius-Babo method, the filtrate is evaporated as far as possible without separating potassium chloride or the supposed potassium mercury chloride in crystals. A current of sulphuretted hydrogen is passed for a rather long time through the solution, which is then allowed to stand for some hours in a moderately warm place. The mercury sulphide, after settling, is repeatedly washed by decantation, then dried in a porcelain capsule on the water-bath, and dissolved in *aqua regia*. The solution is freed from free chlorine and nitric acid by evaporation with the addition of hydrochloric acid. The residue consists of mercuric chloride, and is decomposed electrolytically by the following procedure, which the author regards to be superior to those hitherto recommended. The supposed solution of mercury is put in a minute porcelain capsule, in which are immersed small pieces of sheet-gold and small iron tacks. The mercury present in solution deposits itself upon the gold, and, according to the author's experiments, partly upon the iron nails. After about an hour, when the deposition of the mercury is probably complete (which may be easily ascertained by testing a drop with a drop of sulphuretted hydrogen water), the fragments of the two metals are removed from the liquid, washed with water, dried with filter-paper, and heated to faint redness in a test-tube about 6 Cm. in length and 6 Mm. in width. The mercury forms a grey coating near the heated part of the glass. The fragments of gold and the iron nails are then taken out; a crystal of iodine is put into the tube, which is gently heated. The iodine vapors in contact with the mercurial coating form at first a yellow ring, passing into red (mercuric) iodide. If the iodine is used in excess there is formed a brown ring. By this process 0.00001 Gm. of mercury can be recognized.—Chem. News, July 21, 1896, 40; from Chem. Ztg.

Mercury—Determination by the Potassium Iodide Process.—W. Miles Bramley finds that the order of procedure is important in the determination of the strength of a mercuric chloride solution by the volumetric process with potassium iodide. When 1 Cc. of the $HgCl_2$ solution was placed in a flask and the KI solution added to it from a burette, only 1.3

Cc. was required to produce a permanent mercuric iodide precipitate; whilst when 1 Cc. of the same mercuric solution was diluted with water to 100 Cc., and placed into a burette, it was found that by putting 5 Cc. of the original KI solution in a flask, and adding thereto the diluted mercuric chloride solution, a permanent HgI_2 precipitate was not obtained until 10.4 Cc. had been delivered from the burette. This observation leads the author to conclude that mercuric iodide is insoluble in an excess of mercuric chloride solution, quite as much as it is soluble in excess of potassium iodide solution.—Pharm. Journ., Nov. 7, 1896, 405.

Mercury—Occurrence in Crude Hydrochloric Acid.—L. van Itallie again calls attention to the fact that crude hydrochloric acid, especially that coming from the Rhine Province, may contain mercury. The presence of mercury in the acid is explained by its presence in the iron pyrites used in the manufacture of sulphuric acid. In the process of roasting, the mercury is carried into the lead chambers. The crude chamber acid is used in the decomposition of sodium chloride, and thus it is carried into the hydrochloric acid.—Pharm. Rev., April, 1897, 76; from Pharm. Weekbl., *33*, No. 39.

Mercury—Method of Causing it to Float on Water.—C. E. Strohmey describes a method by which he was able to make mercury float on water. A few drops of mercury, half an ounce of water, and a pinch of red lead, red oxide, vermillion, or other red powder, were shaken together in a small cylindrical bottle. A few small globules of mercury were then found floating together at the centre of the water surface. By repeated shaking a small dish—about $\frac{3}{8}$ inch in diameter and $\frac{1}{16}$ inch deep—was formed, consisting of a large number of mercury globules, and this floated on the water in the same position. The dish did not disappear, if allowed to rest, and always re-formed after shaking the bottle.—Pharm. Journ., Nov. 28, 1896, 459; from "Nature."

Mercury Salts—Transformation.—S. Hader finds that if cold solutions of mercuric nitrate, acetate, or chloride be shaken with mercury, the salt is at once reduced to the mercurous state. On the other hand, mercurous nitrate or chloride in boiling water is converted into the mercuric salt and mercury. Such salts are also dissociated at the common temperature by strong daylight, the effects being very marked in the case of mercurous acetate.—Pharm. Journ., Nov. 28, 1896, 459; from Proceedings of the Chemical Society, 169; 182.

Mercurous Nitrite—Preparation, etc.—Dr. P. C. Ray has discovered that the yellow crystalline deposit sometimes produced in the preparation of mercurous nitrate by the action of dilute nitric acid in the cold on mercury is mercurous nitrite, $Hg_2(NO_2)_2$, regarding which he has contributed a memoir to the Journal of the Asiatic Society of Bengal. The interesting compound is not included by Roscoe and Schlorlemner in their well-known

treatise, nor is there any reference to it to be found in the latest edition of Watts' "Dictionary of Chemistry." To prepare it, yellow nitric acid, of sp. gr. 1.410 is diluted with water in the proportion of 1 to 3, in a flask or beaker. A large excess of mercury is at once poured into the liquid; the heat of the solution of the acid in water helps to start the reaction: a gentle effervescence of gases takes place, and, in the course of about an hour, yellow needles, resembling prismatic sulphur, begin to appear on the surface of the mercury. After a few hours the liquid, together with the mercury, is carefully decanted off, and the salt shaken out of the vessel over porous tiles. The compound is important as throwing additional light on the action of nitric acid on the copper-mercury group of metals, and as supporting the now well-established theory that "in their relation to nitric acid, metals must be divided into two classes"—those which produce ammonia and hydroxylamine from the acid, viz., tin, zinc, cadmium, iron, aluminum, potassium—and those which seem to enter into direct union with the nitrogen of the acid instead of displacing its hydrogen—copper, silver, mercury and bismuth. Dr. Ray assumes that the place of mercury in the Periodic System would naturally justify the expectation that it would yield the analogue of silver nitrite, and that the present compound is a realization of that.—Pharm. Jour., Aug. 1, 1896, 101.

Calomel—Ready Decomposition with Milk Sugar.—August Drescher observes that in the line of modern progress the admixture of cane sugar with calomel had to make way for milk sugar. In his experience the older method with cane sugar was the preferable one, since a mixture of it with calomel, safely ensconced in good powder paper, could be kept a long time unchanged, whereas with milk sugar the change is quite rapid. Usually the quantity of milk sugar is so large as to mark the gray color of the decomposed mercurous salt.—Proc. N. J. Pharm. Assoc., 1896, 55.

Calomel—Value in the Treatment of Persistent Headache.—Dr. Galliard recommends calomel, given in doses of 2 grains every morning for six days consecutively, for the cure of rebellious, persistent, frontal headache, such as is often found in neurasthenia. Care must be taken, however, to avoid mercurial stomatitis by insisting on careful attention to the cleanliness of the mouth, and if a cure is not effected in the prescribed time, the treatment should be abandoned.—Therap. Gaz. (3), xii., 397; from Journ. de Pract.

Mercury and Potassium Hyposulphite—A New Remedy in Syphilis.—The value of the double hyposulphite of potassium and mercury for syphilitic affections which require mercurial treatment has been further reported upon by Rille, who has employed the following solution: Double hyposulphite of potassium and mercury, 125 Cgms. dissolved in 10 Gms. of water. One Pravaz syringeful of this is injected once in five days. The solution should be freshly prepared, as the salt in solution is very unstable.

—Pharm. Jour., July 25, 1896, 79; from Therap. Woch., through Nouv. Rem., xii, 170.

Mercury Pyroborate—Questionable Existence.—The compound obtained by Tokayer on precipitating solution of mercuric chloride with borax, and regarded by him as mercuric pyroborate, HgB_4O_7, has recently been examined by Dupuoy, who finds that it contains no boric acid whatever, but is a basic oxychloride of mercury, having the formula $HgCl_2,3HgO$. This oxychloride may be produced by treating a boiling solution of mercuric chloride with sodium carbonate, keeping the mercuric salt in excess, however, or other oxychlorides will be formed. It is a brownish-red substance, and has recently been successfully employed as an antiseptic, being employed in the form of a 2 per cent. lanolin ointment.—Pharm. Jour., Jan. 30, 1897, 82; from Bull. de la Soc. de Phar. de Bord., xxxvi, 269.

Mercuric Silicofluoride—A Most Powerful Antiseptic and Bactericide.—Hallion, Lefranc and Poupinel state that silicofluoride of mercury is the most powerful in its antiseptic action of all known substances. Experiments on cultures of various pathogenic bacilli show that this substance is at least twice as active as corrosive sublimate, while it is, at the same time, less toxic. Experiments at the Bichât hospital show that the silicofluoride in one per cent. aqueous solution or in a vaseline ointment containing 1 in 2000 has a remarkable and rapid action on surgical wounds, abscesses, eczema and other skin affections, without any appreciable drawbacks.—Pharm. Jour., Aug. 29, 1896, 195; from Bull. Gen. de Thérap., cxxx., 379.

SILVER.

Silver Nitrate—Separation of Copper.—C. J. H. Warden describes the method pursued at the Calcutta Medical Depôt for separating copper nitrate from silver nitrate in the process of manufacturing lunar caustic, the metallic silver always containing a certain amount of copper. The method is based upon the fact that strong nitric acid precipitates silver nitrate from its concentrated solutions. The silver nitrate having been crystallized out pure as far as possible, the blue mother-liquor is evaporated to dryness; the dry salt is powdered, placed into a funnel stopped with asbestos, and percolated with nitric acid, sp. gr. 1.42. The nitric acid dissolves the whole of the copper nitrate and only a very small amount of the silver nitrate, leaving the residual silver salt perfectly white. The nitric acid may be recovered by distillation, and the silver dissolved by it by well known methods.—Pharm. Journ., Jan. 23, 1897, 61.

Silver Nitrate—Commercial Quality.—Prof. Wm. Puckner reports the results of examinations of different silver nitrates of commerce, carried out under his supervision by students of School of Pharmacy of the University of Illinois. Three samples of fused silver nitrate were found to be practically pure, containing only traces of iron and lead. Three samples of diluted silver nitrate (fused in sticks) corresponded well to the claims

of 67 per cent. pure nitrate. On the other hand, two samples of lunar caustic, mounted in wooden holders, contained only 74.24 and 88.2 per cent. of silver nitrate.—West. Drug., June, 1897, 254.

GOLD.

Purple of Cassius—Composition.—Antony and Lucchesi state that when a smaller quantity of mercurous chloride than is required is added to a solution of auric chloride, metallic gold is deposited, according to the equation $3HgCl + AuCl_3 = 3\ HgCl_2 + Au$, but upon adding excess of mercurous chloride, that which remains unchanged assumes the characteristic color of purple of Cassius; similar results are obtained with cuprous chloride. It would thus appear that the true purple of Cassius is merely stannic acid mechanically colored with metallic gold.—Journ. Chem. Soc., 1897, 43; from Gazz. Chim. Ital.

PLATINUM.

Platinum—Recovery from Waste in Potash Analysis.—K. P. McElroy recommends the following method for the recovery of platinum from the waste material resulting in potash analyses. A hot aqueous solution of the platinum potassium chloride is treated with aluminum turnings. A platinum-aluminum couple is formed, and reduction goes on vigorously, hydrochloric acid being added to facilitate the settling of the liberated platinum. After the reduction is complete, more hydrochloric acid is added to dissolve the excess of aluminum, the residual spongy platinum is washed until free from chloride—any suspended platinum being collected on a filter—and, after heating with nitric acid to remove any copper that may have been contained in the aluminum, the spongy platinum may be reconverted into platinum chloride in the well-known manner.—Journ. Amer. Chem. Soc., 1897, 258.

Platinum Phosphides—Conditions of Formation.—In 1884, Clarke and Joslin obtained a definite compound of platinum and phosphorus, having the composition Pt_3P_5, the biphosphide, PtP_2, alone having previously been known. On dissolving the Pt_3P_5 as far as possible in aqua regia, an insoluble protophosphide, PtP, was left, whilst the portion dissolved contained the biphosphide, PtP_2. A. Granger has now experimented on similar lines, and states that platinum wire or foil is not attacked by phosphorus below a red heat, but platinum phosphide, Pt_3P_5, is then produced. At higher temperatures the bodies formed are less rich in phosphorus, approaching the sub-phosphide Pt_2P in composition, whilst at a white heat (*rouge blanc*) the compound does not contain more than 4 per cent. of phosphorus. In the case of spongy platinum, the reaction takes place below red heat, the biphosphide PtP_2, being then formed. This compound is not entirely soluble in aqua regia, the part dissolved corresponding to Pt_3P_5.—Pharm. Journ., Jan. 30, 1897, 82; from Comp. rend., cxxiii., 1284.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(*Including Volatile Oils.*)

Benzin—Methods of Deodorization.—The following methods for deodorizing benzin, while not new, are for convenience reproduced here from "Merck's Report" (Oct. 15, 1896, 536):

1. Shake the benzin repeatedly with fresh portions of metallic mercury, let stand for two days, and then rectify.

2. Shake the benzin with sodium plumbate, and rectify.

3. The odor may be partially removed by simply shaking with charcoal.

4. Digest litharge in a strong solution of soda, and with this mixture shake the benzin.

5. To 56 ounces of water in a suitable container add cautiously 8 fluid ounces of sulphuric acid, and when cold dissolve in the mixture one ounce of potassium permanaganate. To this solution add one gallon of benzin, and agitate frequently for twenty-four hours. Decant the benzin, and wash, in a similar manner, with a solution of 2 drachms of potassium permanganate and 4 drachms of soda in 2 pints of water. Decant the benzin, and finally wash thoroughly with water.

Beta-Naphthol—Detection of the Presence of Alpha-Naphthol.—Dr. Liebman has devised the following test for the detection of alpha-naphthol in beta-naphthol: 0.144 Gm. of beta-naphthol is dissolved in 5 Cc. of alcohol and 15 Cc. of toluene in a graduated tube. In a separate tube 0.14 Gm. of para-nitro-aniline is dissolved in 9 Cc. of dilute hydrochloric acid, cooled and diazotized with 1 Cc. of normal sodium-nitrite solution. One cubic centimeter of this solution is then run into the graduated tube containing the naphthol solution. Shake well and add water. Two layers are formed; the toluene layer is removed by a separating-funnel and shaken up with 5 Cc. of normal caustic soda solution. The color so formed is compared with the color produced in a similar way with solutions of beta-naphthol containing known quantities of the alpha compound. In this way the test is made quantitative as well as qualitative, and shows as little as 0.01 per cent. of the alpha compound.—Merck's Rep., May 1, 1897, 281.

β-Naphthol-Sulphuric Acid—Color Reactions with Various Substances.—E. Pineura describes the color reactions obtained with β-naphthol-sulphuric acid—prepared by dissolving 0.02 Gm. of β-naphthol in 1 Cc. of sulphuric acid of sp. gr. 1.83. From 10 to 15 drops of this reagent are added to about 0.5 Gm. of the substance to be characterized, which, if it

be in solution, must be gently evaporated to dryness. *Tartaric acid* gives at first a blue color, which, if the heat be continued, gradually passes to a very decided green tint; if then, when the mixture has cooled, from 15 to 20 times its volume of water is added, a permanent yellowish-red is developed. *Citric acid* gives an intense blue, which does not turn green with prolonged application of heat. The addition of 15 to 20 times its volume of water gives a colorless solution, or one very faintly yellowish. A small quantity of tartaric acid mixed with the citric acid brings up the green tint which pure citric acid never produces; 10 to 12 per cent. of tartaric acid then produces a dark greenish blue. Pure *Malic acid* gives at once a yellowish-green color, which becomes bright yellow on prolonging the heat. The addition of water turns the color to a bright orange. These reactions are characteristic and easy to observe; it is merely necessary to heat carefully, and to withdraw the capsule from the fire as soon as any color is observed. If it ceases to increase in intensity, we heat afresh if requisite. Other organic substances produce similar colors, but less definite and characteristic. β-Naphthol-sulphuric acid also serves to distinguish the *alkaline nitrites;* 10 drops of this reagent, added to 0.05 Gm. sodium nitrite, dissolved in a few drops of water, give rise to a very intense redness, which is not altered on the addition of water. Alkaline nitrates may be distinguished in an analogous manner by means of a solution of 0.10 Gm. resorcin in 1 Cc. of sulphuric acid at 1.76. The action of this reagent upon 0.05 Gm. potassium or sodium nitrate determines the appearance of a red-brown, which soon becomes a very intense violet, and which passes to orange on the addition of water.—Chem. News, March 12, 1897, 131; from Compt. rend., Feb. 8, 1897.

Petrolatum vs. Vaseline—Relative Medicinal Value.—In a recent advertisement in the N. Y. *Medical Times,* addressed to the medical profession of the United States, the manufacturers of vaseline make the extraordinary statement that the official "petrolatum" is a worthless and often noxious petroleum product, and not at all comparable either in character or effect with the product known by the name of vaseline. Mr. Louis Emanuel calls attention to the injustice of this statement, and protests against the implied piracy of the Committee of Revision in adopting officially "petrolatum" instead of "vaseline." So far as the process for obtaining vaseline or similar petroleum products is concerned, he shows that as early as 1847 a process was patented in England for deodorizing and decolorizing petroleum sediment by means of animal charcoal, and that the patent of the manufacturers of vaseline having expired, there is no more reason why others should not now make a similar petroleum product based upon this expired patent, just as the manufacturers of vaseline employed a modification of the English patent. But beyond all, the pharmacopœial description of petrolatum cannot be compared with the

empirical description that is given for vaseline by its manufacturers.—Amer. Jour. Pharm., Jan., 1897, 21–23.

Iodoform Vasogen—Advantage in the Treatment of Suppurations.—According to "Therap.-Wochenschr.," a compound of a heavy hydrocarbon oil, saturated with oxygen and combined with iodoform, has been used under the name of iodoform vasogen for the disinfection of wounds. It has the advantage that the iodoform is in solution, and not merely suspended, as is the case with glycerin iodoform. It has proved specially useful in injecting tubercular abscesses; in most cases one injection into the cavity of the abscess had been sufficient to effect a cure. It is also serviceable in healing anal fissure.—Pharm. Jour., July 25, 1896, 79; from Nouv. Rem., xii., 137.

Manjak—A Useful Mineral-Petroleum from Barbadoes.—It is stated in "Lit. Dig." that a certain mineral—locally called "Manjak"—has recently been discovered in Barbadoes, which bids fair to outrival in point of utility all the similar substances that occur in various parts of the world. Manjak is of a black color possessing high lustre, and having a bright conchoidal fracture, in appearance closely resembling newly broken pitch. In Barbadoes it is found very near, and sometimes upon, the surface of the ground, in seams varying from 1 foot to 2 feet in thickness, running usually at an angle of about 40° and in close proximity to rocks. It is supposed to have been formed by the drying up and consolidation of petroleum, that occurs in abundance in the same localities, and is often seen oozing out of the ground or floating down the streams. In composition it is not unlike Trinidad pitch, the Utah gilsonite, and the Canadian albertite, but is of quality superior to any of these. It is supposed to equal the Egyptian asphalt in quality, but there is a doubt as to the correctness of this view. Among the various uses to which Manjak has been successfully applied may be mentioned: 1. As insulation for electric wires. 2. As varnishes of the best quality. 3. As bituminous concrete in asphalt roads and pavements. 4. As patent fuel, mixed with peat or other organic matter. 5. In small percentages, as an intensifier of the illuminating power of coal gas. Such satisfactory results have been obtained by its use for insulation that it is expected by some experts that it will soon supplant rubber in all waterproof work.—Merck's Rep., June 15, 1897, 381.

Acetylene—A New and Possible Source of Alcohol, which see.

Acetylene—Explosive Character.—In a paper read at the British Association meeting at Liverpool, Professor Clowes emphasizes the fact that considerable and unnecessary risk is bound to attach to the use of acetylene in the liquid state as an illuminant. He finds that acetylene gives a wider range of explosive proportions than hydrogen, carbon monoxide, ethylene, or methane, and remarks that this is probably due to its endothermic nature, "which leads to the gas being able to generate heat by its own de-

composition. Heat thus generated would undoubtedly aid in causing explosion, and would thus extend the limits of explosive mixtures." It was found that at least 3 per cent. of acetylene must be present in air before the mixture can be kindled by a flame and caused to burn throughout. As the proportion of acetylene is increased, the explosive character is augmented, but when 22 per cent. is present carbon begins to separate during the burning, and the amount of this carbon increases until the explosive character of the mixture disappears, 82 per cent. of acetylene being then present in the air. Berthelot and Vielle, in "Comptes rendus," also report on their investigation of the explosive nature of acetylene. They point out that as an endothermic compound its decomposition sets free a quantity of heat equal to that evolved by combustion of an equal volume of hydrogen to water. In connection with the industrial application of acetylene, the authors have studied the conditions under which acetylene explodes, with a view to indicating the precautions to be observed in its use. They have extended their inquiry to the influence of pressure, concussion, and heating. Hence they conclude that in the use of acetylene the possible disadvantages do not equal its advantages as a lighting material, and cannot limit its application. Too sudden discharge of the compressed gas must be avoided, and care must be taken to absorb heat evolved during compression and by internal reactions, so as to prevent any considerable rise of temperature.—Pharm. Journ., Oct. 31, 1896, 378.

In further explanation of the explosive character of acetylene, Berthelot and Vielle observe that at ordinary pressure it is impossible to cause more than local dissociation of acetylene by an electric spark, a flame, or an explosion of fulminate. If, however, the gas be compressed beyond two atmospheres, the dissociation, if once started, is propagated without sensible diminution throughout the whole volume of gas. The acetylene splits up in a closed tube into pure hydrogen and a friable mass of carbon, which forms a cast of the containing vessel and can be withdrawn intact. The explosion develops a ten-fold pressure at a pressure of twenty atmospheres, the temperature due to the explosion being then 2750° C. Liquid acetylene exhibits the character of a high explosive, but mechanical shock fails to explode either the compressed gas or liquid acetylene, though a spark from the breaking metal was found sufficient to ignite the gas escaping from a cylinder that was allowed to fall. Danger may arise in generating from calcium carbide by using too little water, the carbide becoming incandescent and causing detonation of the gas. Sudden compression of the gas in filling cylinders, or in admitting it into a reducing valve, is also dangerous. On the whole, however, Berthelot and Vielle think the advantages of acetylene as an illuminant outweigh its dangers.—Pharm. Journ., Nov. 28, 1896, 457; from Comptes rendus.

Acetylene—Products of Explosion.—W. A. Bone and J. C. Cain have studied the gaseous products that are formed when acetylene is exploded

with less than its own volume of oxygen. They find that it may be exploded when mixed with one-fifth to one-fourth its volume of oxygen, the products obtained being carbon monoxide and hydrogen, while the excess of acetylene is for the greater part resolved into its elements by the shock of the explosion wave. When acetylene is mixed with less than three-quarters of its own volume of oxygen a thick deposit of carbon occurs, but much less carbon separates when the mixture contains a larger proportion of oxygen.—Journ. Chem. Soc., 1897, 26.

Essential Oils—Tests of Purity.—In the October (1896) report of Schimmel & Co., Leipzig, some of the methods for determining the characters of essential oils and for detecting admixtures are given. The close attention which this firm gives to the characterization of essential oils, coupled with an immense experience, adds to the value of this contribution, which is reproduced in translation in "Pharm. Journ." (Oct. 24, 1896, 357–358), where it may be profitably consulted. It is within the scope of this report only to briefly give the characters of purity ascribed by Schimmel & Co. to the essential oils considered in their report, as follows:

Bergamot Oil.—Sp. gr. tolerably constant between 0.882 and 0.886; rotation, taken in 20 Mm. tube and calculated for a 100 Mm. tube, may vary from + 8° to + 20°; soluble in half its volume of 90 per cent. alcohol without becoming turbid on further dilution, and it may, but does not always, dissolve completely in 80 per cent. alcohol, owing to presence of waxy matter from rind. The determination of the acetic ester of linalool should yield from 33 to 40 per cent., but recently the amount has not on the average been more than 36 per cent. On account of influence of conditions of season, a definite minimum cannot be fixed.

Lemon Oil.—Sp. gr. normally varies from 0.858 to 0.861 at 15° C.; the normal variation of rotation is from + 59° to + 67°. The presence of oil of turpentine, the most frequent adulterant, reduces the rotation, since turpentine oils are either laevo-rotatory or but slightly dextro-rotatory. But with mixtures of oil of orange and turpentine, having nearly the same rotation as oil of lemon, the detection by means of the polariscope is more difficult. Here a process of fractioning described, and examination of the first 10 per cent. of distillate, enables the detection of small quantities of oil of turpentine. The solubility test is inapplicable.

Orange Oil.—Sp. gr. from 0.848 to 0.852, but little altered by admixture of lemon or turpentine oils. The normal rotation, 96° to 98° at 20° C., is the highest of any essential oil. Fractional distillation reveals here also the presence of the oils of lemon and turpentine. The solubility test, as in oil of lemon, is also inapplicable.

Lavender Oil.—Sp. gr. varies between 0.883 and 0.895 at 15° C. Rotation to the left generally from 4° to 8°. Solubility in about three vol-

umes of 70 per cent. alcohol is characteristic. Should contain not less than 30 per cent. of ester-linalyl acetate, and may contain 40 per cent.

Star Anise Oil.—Determination of solidifying point is recommended as the best test of quality, and the best indication of the amount of anethol. As the result of numerous trials, the average solidifying point has been found + 16° C., the highest limit being + 17.5, and the lowest, for genuine oil, + 14°. In making the test the oil should be cooled to + 5°, and then made to crystallize by rubbing the thermometer bulb against the side of the tube. The point at which the mercury ceases to rise is taken as the solidifying point.

Volatile Oils—Quantitative Estimation of Phenols.—Edward Kremers and Oswald Schreiner observe that of the large number of volatile oils containing phenols, but a few have been subjected to examination for the purpose of quantitative estimation. The value of these oils often depends very largely, if not entirely, upon the phenols they contain, and in their present paper the authors have endeavored to supply a method for the estimation of the important phenols, viz., thymol and carvacrol. The following is the method proposed for the

Estimation of Thymol.—From a weighed flask of oil pour out about 5 Cc. into a glass-stoppered burette graduated to $\frac{1}{10}$ Cc. Weigh the flask again; the difference gives the weight of oil used for the experiment. Add about an equal volume of petroleum ether and then note the volume of the mixture carefully. A little water can be added so as to bring the oil up to the scale of graduations on the burette. Now add a 5 per cent. potassium hydrate solution and shake vigorously for a short time, then allow to stand until separation is complete. Note the decrease in the volume of the oil and allow the alkaline solution to run into a 100 Cc. graduated flask. This operation is repeated several times, until no further decrease in the volume of the oil takes place, or better still, until the oil no longer shows Flückiger's test for thymol. To make this test put a few drops of the oil into a test tube, add about twenty drops of chloroform and a small quantity of solid NaOH, and apply heat. If thymol is still present a red color will appear. When all the thymol has been removed notice the volume of the remaining oil carefully. The difference between the volumes of oil before and after shaking with the alkali gives the volume of thymol dissolved. From this the percentage of thymol by volume is readily calculated.

The alkaline solution of thymol is made up to 100 or 200 Cc. as the case may require, using the 5 per cent. alkali as the diluent. To 10 Cc. of this solution in a graduated 500 Cc. flask is added $\frac{1}{10}$ normal iodine solution in slight excess. The thymol is precipitated as a dark reddish-brown iodine compound. In order to know when a sufficient quantity of iodine has been added, remove a few drops from the flask to a test-tube containing some dilute hydrochloric acid. When sufficient iodine is

present the color of the solution shows the presence of iodine, otherwise the liquid is milky, due to the separation of thymol. The solution is now made slightly acid with dilute hydrochloric acid and diluted to 500 Cc. From this 100 Cc. are filtered off and the excess of iodine determined by titration with $\frac{1}{10}$ normal sodium thiosulphate solution. The number of Cc. required, multiplied by five, and deducted from the number of Cc. $\frac{1}{10}$ normal iodine added, gives the number of Cc. of iodine required by the thymol.

Every Cc. $\frac{1}{10}$ normal iodine solution equals 0.003741 gram thymol. Knowing the quantity of thymol in the alkaline solution, the percentage in the original oil is readily found.

Having obtained satisfactory results with thymol, further experiments were made with the view to apply the method to its isomer, carvacrol. The authors found, however, that for the

Estimation of Carvacrol some slight modifications in the method were necessary, and propose the following: The shaking out of the carvacrol from the oil with 5 per cent. alkali solution is the same as that of the thymol. To 10 Cc. of the alkaline solution in a graduated 500 Cc. flask, $\frac{1}{10}$ normal iodine solution is added. To avoid a large excess of iodine the same test as for thymol is applied. The iodide of carvacrol is precipitated as a white, finely divided precipitate, giving the solution a milky appearance. By shaking the solution for a short time the precipitate becomes flocculent, leaving the solution clear or nearly so. Now dilute to 500 Cc. and filter off 100 Cc. Acidulate the filtrate with hydrochloric acid and titrate the liberated iodine with $\frac{1}{10}$ normal sodium thiosulphate. The calculation of the percentage is the same as that for thymol. Every Cc. of $\frac{1}{10}$ normal iodine equals 0.003741 gr. carvacrol. This method for carvacrol differs from that of thymol only in that the separation of the iodide has to be induced by violent shaking and in that the iodide is removed by filtration before acidulating.—Pharm Rev., Oct., 1896, 221–223.

Essential Oils.—Examination of an Adulterant Offered in the London Market.—John Barclay calls attention to an "essential oil," offered in the London market under a "fancy" name for the purpose of reducing essential oils. He finds it to have the specific gravity of 0.869, an optical rotation —59°, a flashing point by Abel's method of 100° F., and to be fairly soluble in three volumes of alcohol of specific gravity 0.820. On fractioning it yields 58.50 per cent. between 155° and 165° F., and 24 per cent more up to 170° F. It contains no aldehydes, and only a trace of ester, and is evidently a laevo-pinene, such as is obtained from *Pinus sylvestris*, *Abies excelsa*, *Pinus maritima*, etc. It has a delicate odor, and may be mixed in considerable proportion with lemon and bergamot oils without the presence of the adulterant being detectable to smell or taste. —Pharm. Journ., Nov. 28, 1896, 463.

Flower Perfumes—Extraction.—Passy suggests that, inasmuch as many flowers do not contain the whole of their odoriferous principles ready-formed, but secrete them gradually as long as vital action continues, that better results would be obtained by prolonging the life of the bloom. For this he suggests the use of water. The flowers are immersed in that fluid, and as soon as it becomes saturated with the odor it is replaced with fresh. The aqueous solutions are then extracted with ether, upon the evaporation of which the odorous bodies are left in a pure state. Simple water might with advantage be supplemented by a saline solution of the same osmotic power as the juices of the plant. The aüthor states that he has experimented with a number of flowers, with good results, particularly in the case of lily of the valley.—Pharm. Journ., May 1, 1897, 369 ; Comptes rendus, cxxiv., 783.

Synthetic Oils—Valuable Additions to the Perfumer's Art.—Joseph Cave read an interesting paper on "Synthetic Oils" at the meeting of the Pennsylvania Pharmaceutical Association, in which he called attention to the importance of their introduction in the manufacture of perfumes. At the head of the list stands the perfume of the violet "*Ionone*," which is unquestionably the finest of all the synthetical products up to the present time. By a patented process, citral and acetone yield a condensation product in the form of a ketone, $C_{13}H_{20}O$, which is converted into ionone upon heating it with diluted sulphuric acid. It is soluble in alcohol, ether, benzene and chloroform, but insoluble in water. It is marketed in 10 per cent. solution, of which about 1 part to 200 is required to make, with the addition of violet, jasmin and tuberose pomade washings, orris oil, etc., an exquisite perfume. Under the name of

"*Neroli*" (not oil of neroli, Rep.), the artificial oil of orange flower has been known for some time. It is a perfect substitute for the natural oil, and has been found by the author to be far stronger and more fragrant than the finest grades of the latter. Its process of manufacture seems to be still a secret with its discoverer.

"*Jasmin Oil*," is an artificial oil of jasmin, for which high claims are made by its discoverer, but Mr. Cave has no experience with it.

"*Lilac Oil*," is a valuable base for lilac perfume, and is, chemically, "terpinol," and consequently a direct derivative of the much despised (in perfumery) turpentine oil.

Other synthetic oils that have come into use are "Cassia Oil" (Cinnamic aldehyde), "Carnation," "Hyacinthe," "Syringa," "Ylang Ylang," "Artificial Rose," "Wintergreen," and "Sassafras."

In the discussion following the reading of this paper, it was stated that some of the synthetic oils—"ionone" and "neroli"—appear to improve by age, while "carnation" seemed to deteriorate. Concerning artificial "sassafras," it was stated that thousands of pounds were shipped to the country where oil of sassafras is produced, and get back from there to the market—but not as artificial oil.—Proc. Penna. Pharm. Assoc., 1896, 43–47.

Victorian Essential Oils—Description of Principal Characters.—John C. Umney has reported to the Imperial Institute upon the character and probable commercial value of a large number of essential oils and essences produced on the Government Farm at Dunolly, Victoria, the following being brief abstracts from his report:

Oil of Anise.—Characters so strikingly different from those of the anise fruit and of star anise that its source cannot be stated until a botanical examination of the seeds yielding the oil has been made. Its sp. gr. is .914 at 15° C.; optical rotation in a 100 Mm. tube, + 16; does not solidify when cooled to 4° C. and stirred; odor more suggestive of fennel than of anise.

Oil of Absinthe.—Color, the usual dark-green; sp. gr., when freed from 40 per cent. of alcohol with which it was mixed, .939 at 15° C.; optical rotation not established on account of deep color; fractioning in comparison with American oil gave the following results:

	Below 200° C.	200°–205° C.	205°–210° C.	Above 210° C.
Dunolly oil	4 per cent.	20 per cent.	28 per cent.	48 per cent.
American oil	15 per cent.	12 per cent.	14 per cent.	59 per cent.

The portion boiling from 200°–205° C. (principally thujone) is slightly higher in this than in the American oil, but the oils are very similar in other respects.

Oil of Boronia Polygalifolia.—Sweet odor resembling tarragon, with slight after-smell of rue; almost colorless; sp. gr. .839, and an optical rotation of + 10. On fractioning 31 per cent. passed at 150°–170° C.: 38 per cent. between 170° and 180° C.; 15 per cent. between 180° and 190° C., and 16 per cent. above 190° C. The ketone boiling at 225° C., which is characteristic of, and usually present to the extent of 70 to 90 per cent. in oil of rue, does not therefore exist in any quantity in the oil from this rutaceous plant, and no crystalline compound could be obtained from the highest fraction of the oil by treatment with sodium bisulphite.

Oil of Eucalyptus Citriodora.—A powerful citronella odor; sp. gr. at 15° C. of .8809; optical rotation of —1 in a tube of 100 Mm. Fractioning yielded: 76 per cent. between 190° and 200° C.; 12 per cent. between 210° and 219° C.; and 12 per cent. residue. By acid sodium sulphite the presence of 90 per cent. of the aldehyde, citronellon, was intimated. While of fine quality, and closely resembling citronella oil, it doubtless cannot compete with the latter for soap and perfumery purposes.

Essences of Jonquille, Millefleurs and Tuberose.—These are of no value

whatever, owing to faulty preparation, want of strength, etc. The odor of the *jonquille* is decidedly good; that of the *millefleurs* bad.

Oils of Rose Geranium and Geranium of Africa.—The oil of *Rose geranium* was of green color (copper absent even in traces); sp. gr. .906 at 15° C.; optical rotation —14.25 in a tube of 100 Mm. The oil designated as *Geranium of Africa*, was yellowish brown; sp. gr., at 15° C., .902; optical rotation —7.5. The two oils correspond well with oils of rose geranium of Grasse and geranium of Africa (Algeria), distilled from pelargonium species grown in those districts, as is shown in the following table, giving also the percentage of geraniol present:

	Sp. Gr. at 15° C.	Optical Rotation in a Tube of 100 Mm.	Geraniol Per Cent.
Dunolly Rose Geranium.....	.906	— 14.25	51.8
Dunolly Geranium of Africa..	.902	— 7.5	62.4
French Rose Geranium......	.894	— 10.75	57.1
Algerian Geranium	.898	— 7.5	69.6

Oil of Lavender.—Pale yellow color; pungent cineol odor of English lavender oil, but distinctly less pleasant; specific gravity .916 at 15° C; optical rotation +11 in a tube of 100 Mm. These characteristics point out the possibility of "true" and "spike," or other lavender. By fractionation 44 per cent. passed between 175° and 190° C; 42 per cent. between 190° and 205°; leaving 14 per cent. residue. The proportion of esters was only 5.25 per cent.—English lavender varying from 7 to 10 per cent. of esters. Alcoholic constituents ($C_{10}H_{18}O$) were present to the amount of 29.75 per cent.; the oil of *Lavendula vera* usually has not less than 45 per cent., while in the oil of *Lavendula spica* it is usually considerably lower.

Oil of Lemon Thyme.—Pale straw color; specific gravity at 15° C of .898; optical rotation in a tube of 100 Mm. —3; characters essentially those of a sample distilled from fresh lemon thyme. The fraction between 210° and 220°, amounted to 28 per cent., and consisted almost entirely of citral (total aldehyde in oil being 21 per cent.); 54 per cent. passed between 220° and 230°, principally, if not entirely, consisting of thymol.

Oil of Myrtle.—The botanical source of this oil is in doubt. It contained 28 per cent. of non-volatile residues, and when purified gave the following results in comparison with true samples of French oil from *Myrtis communis:*

Distilled in	Sp. gr. at 15° C.	Rotation in a Tube of 100 Mm.	Fractionation.			
			Below 170° C.	170°–185° C.	185°–200° C.	Above 200° C.
Dunolly	.916	—5	18 p. c.	9 p. c.	20 p. c.	43 p. c.
France 1	.885	+25	78 p. c.	16 p. c.	4 p. c.	2 p. c.
France 2	.893	+24	56 p. c.	24 p. c.	6 p. c.	14 p. c.

The proportion of dextropinene present in the French oils is very considerable, but the fraction boiling at from 170° to 185° C., in all oils, contains cineol.

Otto of Rose.—Odor good, comparing favorably with Turkish otto; sp. gr., .8886 at 15° C.; does not solidify at 5° C., but becomes slightly opaque. The sp. gr. approximates very closely to its liquid constituent, geraniol, and it is possible that in the case of this sample the stereoptene has been partially removed in the condensation of the oil. More than 75 per cent. of the oil distils between 215° and 235° C. The proportion of alcohols (geraniol) indicated by acetylation is 57.8 per cent.

Oil of Peppermint.—Pale, greenish-yellow color; sp. gr., after removal of added alcohol, .912 at 15° C., which is above that usually found in black and white English and Saxon peppermint oils; optical rotation, —27; fractionation yielded 36 per cent. at 200°–210° C.; 53 per cent. at 210°–230° C.; residue 11 per cent. It contained menthol in form of esters, 8.3 per cent.; free menthol, 45.6 per cent.; total menthol, 53.9 per cent. On the whole the sample compared fairly well with samples distilled from the same species in other countries.

Oil of Pennyroyal.—The results of the author's examination point out with almost certainty that the sample is a mixture of pennyroyal and peppermint oils. It had a marked odor of the two oils; specific gravity .918 at 15°; optical rotation +7 in a tube of 100 Mm. The percentage of alcohol (probably menthol) was 36.02 per cent., of which 8.7 per cent. was calculated as menthol esters and 27.5 per cent. as free menthol. This is at least 10 to 15 per cent. more than yielded by English and American pennyroyal oils.

Oil of Rosemary.—Pale greenish-yellow color; odor, the more pungent, camphoraceous, characteristic of English oil, rather than the softer, more pleasant odor of French rosemary oils; specific gravity, .906; optical rotation, +0.25. Fractionation yielded 13 per cent. below 176° C.; 64 per cent. between 176° and 200° C.; 23 per cent. above 200° C., the latter pointing to a large percentage of borneol, of which the oil was determined

by acetylation to contain 15.01 per cent. The figures obtained compare favorably with those of the finest English oil.

Oil of Sage.—The sample had a strong thyme odor, quite different from that of the oils of sage met with in trade. Sp. gr., after removal of added alcohol, .922; optical rotation, + 2.5. Phenols were present to the amount of 17 per cent. It is evident that this sample had been distilled from *Satureja hortensis* (summer savory), and not from *Salvia officinalis*. Samples of true oil of sage examined contained only 2 to 3 per cent. of phenols, but from 22 to 23 per cent. of alcohols.

Oil of Tansy.—Contained considerable added alcohol, after the removal of which it had the sp. gr. .922, and optical rotation, + 37. By fractionation, the sample yielded about 26 per cent., between 200° and 210° C. It contained neither camphor nor borneol, but thujone, boiling between 200° and 202° C., was present. The oil had a greenish-yellow color and the characteristic odor of the plant, and compares well with American oil, but differs markedly from an English oil (distilled by J. C. Sawer, at Brighton), which was lævorotatory —27. The author infers that the differences observed may be due to climatic influences and soil.

Oil of Thyme of the Alps.—After removal of about 25 per cent. of added alcohol, this oil exhibited the deep reddish-brown color possessed by oils of high phenol percentage distilled from *Thymus vulgaris*, L. Sp. gr. .922; optical rotation not determined. The following table shows that the Victorian oil compares favorably with the French and German oils:

Distilled in	Sp. Gr.	Boiling above 220° C.	Percentage of Phenol.	Remarks.
Dunolly	.922	37 per cent.	33.	Pure.
France (Grasse)......	.901	15 per cent.	11.	Mixed with oil of *Lavandula spica.*
France (Grasse)......	.926	44 per cent.	40.4	Pure.
Germany (white)	.925	38 per cent.	34.	Pure.

The Dunolly oil is particularly free from the oils of wild thyme (*Thymus serpyllum*) and spike (*Lavandula spica*), with which much of the thyme oil of commerce is mixed.

Oil of Vervain.—This sample had the characteristic odor of the so-called verbena, or lemon-grass oil (*Andropogon spec.*), although far more agreeable, but, in all probability is the oil distilled from the common vervain (*Lippia citriodora*). After removal of added alcohol, it had the sp. gr. .894, and an optical rotation of —16. The fractionation of the oil under ordinary atmospheric pressure was unsatisfactory, as considerable

decomposition took place, and became most marked above 220° C. The proportion of aldehydes, showing all the characters of citral, was determined to be 74 per cent. If produced at a sufficiently moderate price, this oil would be of considerable value for soap making and perfumery. The author concludes that with the exception of the oils of eucalyptus and sage, the Dunolly oils seem likely to be of commercial value, some of the products being of fine quality.—Pharm. Journ., Sept. 5 and 19, 1896, 199–201 and 256–257.

Oil of Turpentine—Rectification.— During the rectification of larger quantities of oil of turpentine by a process slightly modified from that of the U. S. P., Prof. Edward Kremers has made some interesting observations by collecting the distillate in fractions, the results of which are given in the shape of tables, and will doubtless be of utility for future reference. For the present purpose it may be stated that the crude oil had a sp. gr. 0.872 at 20°, and turned the plane of polarized light to the right, + 11.616°. Four-fifths of the oil, recovered in four equal fractions, had the sp. gr. respectively of 0.864, 0.866, 0.8702 and 0.8722, before dehydration, and a rotation of $[a]_D$ + 14.180°, + 12.297°, + 11.429° and + 10.700°. These experiments being repeated with three separate quantities of the same oil, they showed surprising uniformity in the same fractions, and thus point out that each consecutive fraction is uniformly distinct from the preceding one—a fact which is further evidenced by experiments determining the quantity of distillate (or fraction) obtained with each degree of rise in temperature. The author collected in one instance four-fifths of the oil without fractioning, thus obtaining a product corresponding to the official rectified oil. This, when dehydrated with exsiccated sodium sulphate, had a sp. gr., 0.864 at 20°, and deflected the plane of polarized light $[a]_D =$ + 12.177. The oil was pleasantly odorous; but the author emphasizes the fact that the rectified oil will readily undergo the process of so-called resinification under the ordinary conditions of storage on the shelves of the drug store, and there is abundant evidence that even the best of the fractions obtained during the course of these exhaustive experiments will undergo rapid change.—Pharm. Rev., Jan. 1897, 7–9.

Oil of Turpentine—Cause of Odor.—It is supposed that the odor of turpentine oil is not due to its principal constituent, pinene, but to an oxidation product of this hydrocarbon. This oxidation product is supposed to be an aldehyde, probably $C_{10}H_{16}O_3$, which is removed from the oil upon its rectification with water vapor, especially after the oil has been shaken with lime water or milk of lime. The amount of this aldehyde is, however, said never to exceed one per cent., because it soon condenses with the elimination of water, forming resinous substances and thus causing the thickening or resinification of the oil. E. von Szigethy has recently obtained an odorless turpentine oil by rectification in a rarified atmosphere of carbon dioxide, and claims that the odor of the oil is due only to the

oxidizing influence of the air.—Pharm. Rev., May 1897, 93; from N. Erfahr. u Erfind., 24, 173.

Terpin Hydrate—Preparation by the Intervention of Methyl Alcohol.—Edward T. Hahn has tried the different published methods for preparing terpin hydrate from oil of turpentine. By the method of Carl Hempel—which depends upon the admixture of 120 Cc. oil of turpentine, 30 Cc. alcohol (sp. gr. 0.816), and 30 Cc. nitric acid (sp. gr. 1.35), in the order named, allowing the mixture to stand three days, shaking occasionally, then pouring the mixture into a flat dish, adding 15 Cc. alcohol and allowing to stand at rest at a temperature of about 18° C.—he obtained at the end of two weeks about 13 Gm. of crystals, which when purified by recrystallization from boiling alcohol yielded 8 Gm. of terpin hydrate of official character and quality. On account of the high price of ethyl alcohol, the author repeated the experiment with methyl alcohol (sp. gr. 0.801) in place of ethyl alcohol, using the ingredients in the same proportion and in the same manner. Crystals were obtained in a shorter time, but the yield was less, being only 7.32 Gm. of crude crystals, from which 3.2 Gm. of terpin hydrate, conforming to the requirements of the U. S. P., were obtained. The use of wood alcohol probably points out the manner in which the commercial compound is obtained, the crystals and their aroma having a closer resemblance to the latter than those obtained by employing ethyl alcohol.—Am. Journ. Pharm., Feb., 1897, 73–75.

Cedrene—Characters and Comparison with a Hydrocarbon from Santalal.—A. C. Chapman and H. E. Burgess have investigated the chemical properties of cedrene and compared it with the hydrocarbon—with which it is said to be identical—obtained by the action of phosphorus pentoxide on santalal. The cedrene was obtained from cedar wood oil by fractional distillation under reduced pressure; its boiling point (corr.) was 261°–262°, its density at 15° / 15° was 0.9359, and it produced a lævo-rotation of 60° (in 100 Mm. tube). The santalal was obtained from santal-wood oil by fractional distillation; its boiling point was 301°–306°, its density was 0.9793, and its specific rotatory power at 27° was −14°42′ for sodium light. The general properties of santalal are those of an aldehyde, and on oxidation it yielded santalenic acid, which crystallized in thin, pearly plates. By treatment with phosphorus pentoxide the hydrocarbon $C_{15}H_{22}$ was prepared from santalal. This hydrocarbon resembled cedrene in being unsaturated and combining directly with hydrogen chloride and bromide, though no definite compound could be isolated in either case. Both yielded negative results with the oxides of nitrogen and with nitrosyl chloride. The hydrocarbon, however, though very similar to cedrene, is not identical with it. Its boiling point is 140°–145°, density 0.9359, and it produces a dextro-rotation of 5°45′.—Pharm. Jour., Aug. 29, 1896, 179; from Proc. Chem. Soc., 168, p. 140.

Oil of Cedar Wood—Characters.—L. Kousset, using material obtained from the pencil works at St. Paul-en-Jarez, obtained absolutely pure essential oil of cedar wood, free from adulteration, and fractioned it *in vacuo*. Four-fifths of the oil constitutes a hydrocarbon, boiling at 125° to 130°, at 9 Mm. pressure. This hydrocarbon is *cedrene*, $C_{15}H_{24}$. It is a sesquiterpene, and acts on polarized light $a_{D} = -47° 54'$.—Chem. News, June 4, 1897, 276; from Bull. Soc. Chim. de Paris, 1897, No. 9.

Oil of Cade—Correction of Odor.—Yaucher says that the bad odor of oil of cade, which is one of the chief objections to its use, is wonderfully covered by acetone. He therefore recommends the preparation of

Oil of Cade Collodion from collodion in which acetone is used as a solvent instead of spirituous ether.—Chem. and Drugg., Jan. 2, 1897, 16.

Oil of Amber—Use in the Treatment of Whooping Cough.—Dr. Murrell has used oil of amber for some years, both internally and externally, in the treatment of whooping cough. Externally he orders a teaspoonful of the oil to be rubbed along the course of the spine night and morning. For internal administration from 3 to 10 drops may be taken every four hours on a piece of sugar; but this mode of administration presents some difficulty in the case of children, for whom a mixture is preferable. Formulas for a *Mixture* of oil of amber and a *Liniment* will be found under their respective headings under "Pharmacy."—Chem. and Drugg., Aug. 22, 1896, 311; from Clinical Sketches.

Oil of Lemon—Analysis.—A. Soldini and E. Berte have contributed the results of their studies upon the methods employed for estimating the quality of oil of lemon. They give details of their investigations and conclude that fractional distillation *in vacuo*, in conjunction with the polarimeter, and the estimation of citral, will fairly solve the difficult question. These will reveal the presence of oil of turpentine and other adulterants, and determine their quantities approximately; but absolute quantitative determinations are as yet unattainable, though the way is now clear to more complete results. The trade should be satisfied for the present with a method that will on the one hand establish the purity of the oil, and on the other determine the foreign additions approximately. Chem. and Drugg., Jan. 2, 1897, 25–26.

In a subsequent paper the authors give the results of the practical application of this method upon three samples of oil of lemon, all of which proved to be adulterated. These results are a proof of the fact that, though the adulterants can be balanced to give a direct rotation equal to the pure oil, the distillation method serves to reveal the impurity. Oil of lemon may be declared as pure when the optical rotation of the distillate of half its volume is at least 0.30 higher than the residue of the distillation. If it is lower the presence *of more* than 2 per cent. turpentine is indicated. A residue showing a higher rotation than the original oil indicates the

presence of oil of orange, or terpene of either lemon or orange, which indications are confirmed by the qualitative reaction as well as by the low percentage of citral (especially in the case of adulteration with terpene), which, co-ordinated with other tests, will tell in the great majority of cases the adulterant used.—Ibid., April 24, 1897, 669.

Oil of Lemon—Preservation.—Schimmel & Co., in their Report for October, 1896, record the results of some experiments which show that the dehydration of lemon oil by sodium sulphate as a measure for its preservation is not only of no use, but rather detrimental to the oil. They furthermore show that the best method consists in keeping the oil in a vial filled up to the neck, carefully stoppered so as to exclude air, in a dark and cool place.—Pharm. Rev., Jan., 1897, 16.

Oil of Lemon, etc.—Preservation.—Frederick Lester observes that during the last five years he has had considerable experience with the preservation of oils of lemon, orange and bergamot. These oils have always given more or less trouble in keeping. But if kept in well-filled, tightly corked bottles in a dark place no trouble will be experienced in keeping them. Recently some experiments were made to see if the light would have any deteriorating effect if the vessels were tightly corked and well filled. These have shown that where the oil is exposed to the light it does rapidly deteriorate. So that in order properly to keep the oils named they should be placed in well-filled, tightly corked bottles in a dark place. Samples so kept for three years are fresh and sweet to-day.—West. Drug., July, 1896, 298.

Oils of Orange and Lemon—Preservation.—S. H. Hill states that he keeps the oils of orange and of lemon free from oxidizing by the addition of 1 oz. of alcohol and 1 oz. of glycerin to each pound of the oil.—Proc. Penna. Phar. Assoc., 1896, 121.

Oil of Petitgrain Citronnier — Characters as Obtained from Lemon Leaves and Twigs.—Messrs. W. J. Bush & Co. describe the volatile oil obtained by distillation from the leaves and twigs of the lemon tree in the same way as ordinary "petitgrain" is obtained from the orange tree. It has an odor resembling the orange petitgrain, but less intense and with a blending of the odor of lemon. Its sp. gr. is 0.878 at 15°, and rotation in a 10 Cm. tube + 9.4°. It makes a turbid mixture with ten times its volume of 80 per cent. alcohol, but is readily soluble in its own volume of 90 per cent. It contains esters equivalent to 10.1 per cent. of linalool, and also 11 per cent. of aldehyde (citral). Orange petitgrain has a sp. gr. of 0.890 to 0.895, is slightly lævo-rotatory, is soluble in two volumes of 80 per cent. alcohol, and contains esters equivalent to 40 per cent. and upwards of linalool. Schimmel & Co., who also reported on a sample of oil of petitgrain citronnier, found the sp. gr. to be 0.869 at 15°, rot. + 34°, ester content equivalent to 4 per cent. linalool, and that it was not soluble

in $3\frac{1}{2}$ volumes of 90 per cent. alcohol. Apparently this sample must have been distilled from material containing a large proportion of immature fruits, as the characters are intermediate between those of the sample of Messrs. Bush & Co., and those of ordinary lemon oil from peel.—Chem. & Drugg., Jan. 9, 1897, 53.

Oil of Peppermint—Effects of Climate and Soil on its Composition.—In a paper read at a meeting of the British Pharm. Society in February, 1896 (see Proceedings 1896, 561), John C. Umney stated that the principal difference found between black and white Mitcham (England) peppermint oils was in the proportion of the esters of menthol present, the latter being as high as 14 per cent., whilst the former does not usually exceed 7 per cent. He has since had opportunity of confirming these ester percentages on other samples, and although they may be to a certain extent modified by the method of distillation, they appear to be distinctly characteristic of the two varieties. He has endeavored to extend his investigation also to authentic samples of the black and white peppermint oils distilled in the United States, but has succeeded in obtaining such only distilled from plants grown in America from black Mitcham roots and Japanese roots respectively. The samples of oil distilled in the United States from black Mitcham plants vary in ester percentages somewhat, but the ester percentage in Wayne County oil is in each instance higher than Michigan oil—the other figures showing but slight variation. Furthermore, the ester percentages of the American oils are higher than usually found in black peppermint oil from plants cultivated in England, but the physical characters and total menthol are very similar. In the oils from plants grown from Japanese roots the ester percentage is very low, one sample yielding only 2.5 per cent.—the lowest obtained by the author in any peppermint oil. The results of examinations of the oils from the different plants grown in the United States and in England is given in two tables, giving their specific gravities, optical rotation, percentages of menthol ester and total menthol, and the color reaction by the U. S. P. method. Concerning the latter reaction, the author has already had occasion, in the paper previously referred to, to mention that the U. S. P. color reactions afford striking differences between oils of high and low ester values, and he finds confirmation in the present examination, the intensity of coloration produced by acids following the ester percentages without exception. Thus, in the case of Japanese oils of peppermint, which contain only small percentages of menthol ester, the slight color reaction appears to be typical for them.

From the author's recorded results it seems possible that the oil produced in America from Mitcham black peppermint plants is slightly modified, and in certain districts the ester percentage materially increased. This is doubtless attributable to conditions of soil and climate, for it is unlikely that the higher ester percentage of many Wayne county oils as

compared with Michigan and other American oils is due solely to superior methods of distillation. In the case of Japanese peppermint plants grown in England and America, climate and soil appear to effect but little alteration in the oil distilled from them, the total menthol percentage being but slightly reduced. Concerning the American oils, it is unfortunate that they so frequently contain oils of spearmint and erigeron. American growers might therefore profitably take to heart the author's observation, made during the discussion following his paper, that the great superiority of English over American peppermint oil is due to the care taken in the cultivation, scarcely a weed being seen by him in a 100 acre field during a recent visit to Mitcham.—Yearbook of Pharm., 1896, 316–320.

American Oil of Peppermint—Presence of Sulphur Derivatives.—In an investigation of American peppermint oil conducted by Drs. F. B. Power and Clemens Kleber (see Proceedings 1895, 1036), it was shown that this oil is one of the most complicated known, as many as fifteen different constituents having been identified and characterized. During the process of rectification of crude peppermint oil it was, moreover, observed regularly that in the beginning of the distillation a peculiar disagreeable odor escaped and rapidly filled the room in which the operation was conducted. This has been the subject of investigation by Dr. Clemens Kleber, who has succeeded in establishing that this disagreeable odor is due to

Methyl disulphide, which must therefore be added to the already known constituents of American peppermint oil. Its presence is easily determined if from about 50 Cc. of the oil a few drops are distilled with sufficient condensation, upon shaking the distillate with an aqueous solution of mercuric chloride, when a white crystalline precipitate forms, which is a compound of mercuric chloride and methyl disulphide. The author observes, furthermore, that the methyl disulphide is not the only sulphur compound present in the oil of peppermint. In the course of rectification a disagreeable smelling fraction is obtained, evidently the product of decomposition of an organic sulphur compound, which will be the subject of further investigation.—Pharm. Rev., Dec., 1896, 269–270.

Russian Oil of Peppermint—Unsatisfactory Quality.—It is stated in "Pharm. Post" (1897, 218), that considerable attention is given in Russia to the cultivation of *Mentha*, 16 millon kilos of the herb having been gathered in the district of Rostow alone. The best mint came from the neighborhood of Wanow. The collection of oil, however, is carried on in the most primitive manner, the result being a small yield and an oil unsatisfactory in quality.

Oil of Peppermint—Use of Acetic Anhydride for Determining Free and Combined Menthol.—Lyman F. Kebler, after a brief resumé of the use of acetic anhydride in oil analysis, suggests a modification of the method heretofore suggested by Benedikt and Ulzer for the estimation of fatty

acids, and subsequently applied by F. B. Power and C. Kleber, for the estimation of menthol in oil of peppermint, whereby the estimation may be effected within three hours instead of the greater part of a day. The first step is the

Estimation of the Combined Menthol.—Place from 10 to 12 grammes of the oil into a suitable flask, add about 12 Cc. of normal alcoholic solution of sodium hydroxide, connect the flask with an inverted condenser, and boil for one hour. Re-titrate the excess of alkali by means of standard sulphuric acid, using phenolphthalein as indicator. Each cubic centimeter of standardized alkali consumed corresponds to 0.156 grammes of menthol as esters. The second step consists in the

Estimation of the Total Menthol.—Place from 12 to 15 Gms. of the oil in a suitable flask; add an equal weight of acetic anhydride and 2 Gms. of anhydrous sodium acetate; attach a reflux condenser and boil the contents of the flask one hour. Allow the mixture to cool somewhat, transfer to a 250 Cc. separatory funnel, with successive portions of water, using about 150 Cc. Agitate the funnel and contents well, set aside a few minutes so that the mixture will separate into two layers, withdraw the aqueous layer, and wash again in the same way with 150 Cc. of water. Having removed the second wash water, add 50 Cc. of water, a few drops of phenolphthalein solution, and just enough of a 5 per cent. aqueous solution of sodium hydroxide to render the contents of the funnel pinkish, after thoroughly agitating; then add enough water so that the aqueous portion will amount to about 150 Cc.; agitate well, allow the mixture to separate and withdraw the alkaline aqueous solution. Wash the oily layer once more with 150 Cc. of water; then, having removed the water as completely as possible, transfer the acetylized oil to a suitable flask, using a small amount of alcohol to transfer the last portions, add from 50 to 60 Cc. of normal alcoholic sodium hydroxide solution, connect the flask to an inverted condenser, and boil for one hour. Retitrate the excess of alkaline solution by means of normal sulphuric acid. Each cubic centimeter of normal alkali combined corresponds to 0.156 Gm. of menthol, and by deducting the amount of menthol contained in the oil in the form of esters, as determined by the preliminary experiment, the amount of free menthol in the sample is ascertained. The author, in a table, gives the results of the examination by this method of ten samples of commercial oil, including one of commercial menthol, which prove that genuine oil of peppermint is a most variable product, the combined menthol varying from 3 to 16 per cent., while the total may vary from 30 to 80 per cent.—Amer. Jour. Pharm., April, 1897, 189–195.

Oil of Peppermint—Adulteration.—Lyman F. Kebler has had occasion to examine a sample of peppermint oil, representing a lot of over 500 lbs., which, while complying so closely with the U. S. P. requirements that an

analyst would hesitate before pronouncing it adulterated, nevertheless it contains over 50 per cent. of a constituent that passed over during fractioning below 200° C., while genuine oil should not yield more than 5 per cent. below that temperature. This fraction passing between 140° and 180°, amounting to 42 per cent., possessed the odor of turpentine, had the specific gravity of turpentine oil (0.8739), and fulminated with iodine. The residue remaining after distilling off the fractions up to 275° C., amounted to 19 per cent. of the original oil. It was viscous, had a sp. gr. 0.9188, was insoluble in alcohol, and resembled a fixed oil in appearance, though possessing a saponification number of 55.—Amer. Drug., Aug. 10, 1896, 64.

Oil of Spearmint—Yield and Characters.—Schimmel & Co. report a yield of 0.3 per cent. of oil from the first cut of spearmint in July, and only 0.18 per cent. from the second crop in October. The oil of the second crop also was less fine in odor, and had a lower sp. gr. and rotatory power, namely 0.961 and —37° 20′ against 0.980 and —42° 30′ of the oil of the first crop, whilst no fraction of oil heavier than water was noticed.—Pharm. Rev., June, 1897, 115; from Schimmel & Co.'s Semi-Annual Rep., April, 1897.

Oil of Spearmint—Application of the Carvoxime Method to Determine Adulteration.—Edward Kremers and Oswald Schreiner, in continuation of their studies upon the applicability of the carvoxime reaction to the quantitative estimation of carvone in volatile oils (see Proceedings 1896, 740) have now practically applied the method to the estimation of carvone in adulterated spearmint oil, with the results shown in the following table:

Oil.	Sp.gr. at 20°.	Rotatory power at 20° in 100 Mm. tube.	Carvone as oxime.	Carvone fraction 220° to 230°.	Carvone calculated.	Solubility.
Cedar-wood.	0.949	—23°42′	—	—	—	
Gurjun balsam.	0.915	—123°24′	—	—	—	
Spearmint.	0.933	—47°45′	56.40 p. c. 56.20 "	50.28 p. c.		Soluble in alcohol, glacial acetic acid and carbon disulphide in all proportions.
Spearmint containing 25 p. c. cedar-wood.	0.940	—40°9′	40.80 p. c. 40.49 "	27.20 p. c.	42.22 p. c.	do.
Spearmint containing 25 p. c. gurjun balsam oil.	0.929	—65°4′	39.98 p. c. 40.12 "	29.68 p. c.	42.22 p. c.	do.
U. S. P. Requirements.	0.930 to 0.940					With an equal volume of alcohol it forms a clear solution, which is neutral or slightly acid to litmus paper. When somewhat further diluted with alcohol, it becomes turbid. It also yields a clear solution with an equal volume of glacial acetic acid and with half its volume of carbon disulphide; but with an equal volume of the latter it forms a turbid mixture.
Mixture of 66⅔ p. c. cedar-wood. 33⅓ " gurjun balsam.	0.938	—55°34′				
Mixture of 50 p. c. spearmint. 33⅓ " cedar-wood. 16⅔ " gurjun balsam.	0.936	—47°30′	29.79 p. c.		28.20 p. c.	

The oils of cedar-wood and of gurjun balsam were used as adulterants in the foregoing experiments, owing to the fact that large quantities of these oils are being distilled, and that little appears to be definitely known as to the use to which they are put. It is supposed that they are used for the purpose of adulteration, and that among oils so adulterated, spearmint oil might not have escaped the keen eye of the adulterator. The spearmint oil, as well as the cedar-wood and gurjun balsam oil used in these experiments, were all authentic and of known source, their character being sufficiently indicated in the table. Summing up their results, the authors express the opinion that the carvoxime method with smaller amounts of material gives much better results than the fractional distillation method with comparatively large quantities of oil. It is, therefore, more economic as well as more reliable. Furthermore, the oily distillate obtained by the

distillation with water-vapor, especially when collected in fractions, can serve conveniently for the examination of the adulterant. In this particular case, Wallach's sesquiterpene reaction might be applied to advantage. —Pharm. Rev., Nov. 1896, 244–246.

Oil from Monarda punctata, L.—Chemical Composition.—In a paper on the chemical composition of the volatile oil from *Monarda fistulosa* (see Proceedings 1895, 256), Prof. Edward Kremers called attention to the fact that although examinations of four specimens of *Monarda punctata* have been recorded, none of these specimens are authentic. Wm. R. Schumann and Edward Kremers have now had opportunity to make an examination of *Monarda punctata* upon authentic material. The material from which the oil was obtained was collected early in August near Pine Bluff, about 15 miles west of Madison (Wisconsin), and was identified by Prof. L. S. Cheney, of the University of Wisconsin. The flowering herb was distilled with water vapor while still fresh. The oil is of an amber-yellow color, with a pleasant yet characteristic mint-like odor, sp. gr., 0.9307 at 20° C. It turns the plane of polarization + 0.05479 to the right at 20°. Caustic soda solution of 10 per cent. removed the phenols amounting to 56 per cent., the phenol proving to be thymol. The portion not soluble in 10 per cent. soda solution was subjected to fractional distillation, which revealed the presence of cymene, and probably of linalool.

A second lot of young plants, collected May 31, yielded 3.39 per cent. of oil calculated for the dry substance. This oil yielded a little over 61 per cent. of phenol (thymol). Its specific gravity was 0.925 at 20°.—Pharm. Rev., Oct. 1896, 223.

Oil of Monarda fistulosa, L.—Phenol-Content.—In a previous report (see Proceedings 1896, 242), E. J. Melzner and Edward Kremers had given the results of an investigation of the chemical constituents of the oil of wild bergamot. Mr. Melzner has continued this investigation with the prime object to ascertain something more about the phenol and about the phenol-content of the oil at different seasons, while another object was to ascertain what the other constituents of the oil are besides carvacrol and cymene. He was compelled to drop the latter subject, however, and now reports simply on the phenol contents of the oil obtained at eleven different dates, beginning with July 6 and ending with September 12, 1896. He defines and explains the method employed to determine the phenols, and gives his results in the form of three tables, which must be consulted in the original paper. A comparison of the oils obtained in 1895 and those obtained during the corresponding period in 1896, however, shows that very little difference exists. The average percentage of phenol during 1895 was 66.96 per cent. by volume and 55.93 per cent. by titration, respectively, whereas the corresponding figures for 1896 are 64.03 per cent. and 55.64 per cent.—Pharm. Rev., May 1897, 86–87.

Otto of Rose—Composition.—W. J. Bush & Co. confirm Mr. J. C. Um-

ney's figures for the average composition of Turkish otto of rose, in so far that a sample examined by them in November, 1895, gave just 72 per cent. of alcohol—reckoned as $C_{10}H_{18}O$—, of which 4.3 per cent. was in the form of esters. They think his limits of solidifying-point and sp. gr. are rather too narrow, however, as they have had Turkish oils with a solidifying-point as low as 19° C., and others with a sp. gr. as low as 0.860 at 20° C. (about 0.852 at 30° C.) in which they were unable to detect by the nose, or otherwise, any inferiority to standard samples. It must, of course, be borne in mind that these proportions of stearoptene to alcohols relate only to Bulgarian otto, in which they happen to be fairly constant. Messrs. Bush & Co. distil considerable quantities of otto of rose at Grasse, and find that different fractions of the oil vary enormously in proportional composition and also in fragrance. The first third of the total yield from each batch is very rich in stearoptene, but neither so strong nor so pure in odor as the remainder. The difference in composition will be seen by the following figures:

	First third.	Remainder.
Solidifying-point	26° to 27°	5° to 6.5°
Sp. gr. at 20° C.	0.8189 to 0.8224	0.8812 to 0.8838
Rotation	$(a)_D$ —4° to —5°	—1.9° to —2.5°
Color	Greenish.	Yellow.

The amount of stearoptene appears also to be influenced by the wetness or dryness of the season, and also to vary in the earlier and later gatherings of the same crop.—Chem and Drug., Jan. 9, 1897, 53.

Otto of Rose—The Sense of Smell as a Test of Quality.—Referring to an article on oil of rose in the "Chem. and Drugg.," in which the principle is approved of rejecting all otto with a freezing point under 65° F. to 68° F., sp. gr. varying beyond the limits of 0.850 to 0.856 at 86° F., and optical rotation that does not correspond to —2.3° to —2.7°, M. Conroy points out the fallacies of this assumption, and summarizes his position regarding those constants as follows:

The freezing point of 65° to 68° F. allows of 11 per cent. admixture of geranium oil; the sp. gr. test at 86° F., ranging from 0.850 to 0.856, allows of 15.8 per cent. of geranium oil; the optical rotation test of —2.3° to —2.7° allows of 5.5 per cent. admixture of geranium oil, or with as much as we like if the rotation figures of the oil be corrected by the addition of 5 per cent. of citrene. It is evident from this that these physical tests are useless for all practical purposes, and chemical tests are no better. We are, therefore, forced to judge in the old way by our sense of smell; the best way, in Mr. Conroy's opinion, being to dissolve one drop of otto in about 20 drops of rectified spirit, pour this into one ounce of warm water at 100° F., and shake well up. Reduced in this way one gets a better chance of noticing any foreign oil in the otto, especially if compared with the best standard sample we can obtain, treated in a similar way. In this

way a sharp nose will readily detect an admixture of 5 per cent. of geranium oil in otto of rose.—Pharm. Journ., Nov. 28, 1896, 474; from Proc. Liverpool Chem. Assoc.

Otto of Rose—Cause of Softness of Turkish as Compared to French Otto.—It has been shown by J. Dupont and J. Guerlain that French otto of rose contains an ether which is saponified by prolonged ebullition with water, owing to which fact probably it cannot be detected in the Turkish oil. E. Charabot and G. Chiris also claim to have discovered an acid in rose water, which they assume to be produced by saponification of an ether existing in otto of rose. The amount of acid detected was equivalent to 0.0003 Gm. of acetic acid per litre, or to the saponification of 0.00098 Gm. of ether per litre of water distilled. It is suggested that the destruction of this ether during the distillation of Turkish roses probably accounts for the greater softness of Turkish as compared with French otto of rose.—Pharm. Journ., Dec. 26, 1896, 545: from Comp. rend., cxxiii, 700 and 752.

Oil of Palmarosa—Characters and Constituents.—The oil of *Andropogon Schœnanthus*, L., while it has frequently been examined, the material upon which the examinations were made was often of rather doubtful origin. E. Gildemeister and K. Stephan have now made an examination of this oil, which is based upon numerous observations in the laboratories of Schimmel & Co. They found that the action of commercial specimens on polarized light varied from $+1° 40'$ to $-1° 55'$. A rotatory power of $+39°$, as given in the Pharmacographia Indica, was never observed. All of the specimens were soluble in three parts of 70 per cent. (by volume) alcohol. Adulterations with cedar oil, gurjun balsam, turpentine oil, cocoanut oil and paraffin oils, can thereby be readily detected. A second grade oil is brought into the market as gingergrass oil, which is almost always adulterated. The amount of free geraniol in four oils was found to vary from 68.23 to 83.15 per cent.; that of geranyl ester from 8.48 to 13.35 per cent.; that of total geraniol from 76.9 to 91.63 per cent. In the esters, geraniol is combined with acetic and normal capronic acids. There is further present about 1 per cent. of dipentene and probably traces of methyl heptenone. Tests for terpinene and phellandrene gave negative results.—Arch. d. Pharm., 234 (1896), 321.

Oil of Citronella—Chemistry of Some of its Constituents and Derivatives.—In a former paper F. Tiemann and R. Schmidt have suggested structural formulas for citronellol, citronellal and citronellic acid. They also demonstrated that upon dehydration citronellol could be converted into a cyclic alcohol, isopulegol, which alcohol upon oxidation yielded the ketone isopulegone. These compounds in many respects closely resemble pulegol and pulegone, but still are pronounced different from their respective isomers. They now show that by shaking isopulegone with aqueous barium hydroxide solution for 50–60 hours, or by letting it stand with an

alcoholic solution of the same alkali for the same length of time, it is converted quantitatively into pulegone. Of the several possible explanations, some credence at least seems to be given to the assumption that the iso-compounds have a cycle of five members, whereas pulegone is known to be a derivative of hexa-methylene. The authors have also made a special study of the oxydation of the lævo as well as the dextro forms of citronellol. The oxydation of the dextro form, as the cheaper, was studied first. The experience gained was then applied to the study of l-citronellol (rhodinol) from rose oil and from Réunion-geranium oil (réuniol). In addition to citronellal and citronellic acid, iso-pulegone was isolated in the form of its carbazone. The authors are of the opinion that the supposed menthone of Barbier and Bouveault (C. r. 122, 727) is identical with isopulegone.—Pharm. Rev., May 1897, 94; from Berichte, *30*, 33.

Oil of Anise—Adulteration with Fennel Stearoptene.—The chemists of Schimmel & Co. have found that the stearoptene of fennel oil is used for the adulteration of anise oil. The observations of years indicate that anise oil is slightly lævogyrate, while fennel oil is strongly dextrogyrate. Inasmuch, therefore, as the fennel stearoptene not only contains anethol —which is common to both oils—but usually the dextrogyrate fenchone, the addition of such stearoptene to anise oil materially affects the rotatory power of the latter.—Pharm. Rev., May 1897, 94; from Schimmel's Rep., April 1897.

Oil of Cloves—Constituents.—The chemists of Schimmel & Co., in the course of their examination of clove oil, have isolated quite a large quantity of furfurol, which was well characterized by its reactions. The problem, however, still remained, what constitutes the principle of the peculiar fruit-ether-like flavor characteristic of oil of cloves and absent in mixtures of eugenol, caryophyllene and furfurol? This special flavor is particularly noticeable in the first fractions of the oil. This having been separated from a large quantity of the oil, it was finally, with much difficulty, obtained in a pure condition and having a constant boiling point of 151° to 152°. An elementary analysis yielded the formula $C_7H_{14}O$, and it was proven to be

Methyl amylketone ($CH_3(CH_2)_4CO.CH_3$), a body hitherto not observed as a constituent of essential oils. It has a marked fruit-ether flavor, and when a trace of it is added to a mixture of eugenol and caryophyllene it at once imparts to it the characteristic clove aroma. It is present only in so minute a quantity that one should hardly suppose that it could exercise such a marked odoriferous influence; but observation proves that this is a fact in this as well as in other essential oils with principles extremely volatile and present only in the most minute quantity.—Pharm. Rev., June, 1897, 115; from Schimmel & Co.'s Semi-Annual Report, April, 1897.

Oil of Bengal Cardamom—Characters.—Schimmel & Co. report a

yield of 1.12 per cent. of a light yellow oil obtained from Bengal cardamom (*Amomum aromaticum*, Roxb.), by distillation. It had the specific gravity 0.920 at 15°, a lævogyrate rotation of —12.41°, and a strong odor of cineol; it is soluble in one or more parts of 80 per cent. alcohol. The larger part passed over below 220° in a fractional distillation, leaving, however, a rather large residue. In order to ascertain the presence of cineol, some of the first fraction was diluted with 15 times its volume of petroleum ether and dry hydrobromic acid was passed into the mixture, properly cooling it. By subsequent decomposition with water, pure cineol was separated from the hydrobromic acid addition product; the cineol had its boiling point at 175° to 176°, the specific gravity of 0.924 and was optically inactive; after oxidation by means of potassium permanganate by the method of Wallach and Gildemeister, it yielded cineolic acid, melting at 197°. Ceylon as well as Bengal cardamom, therefore, contains cineol, and both have some resemblance to each other in the odor; but the oil of Bengal cardamom will hardly ever find any practical use for want of the characteristic cardamom aroma.—Pharm. Rev., June, 1897, 114; from Schimmel & Co's. Semi-Annual Report, April, 1897.

Oil of Wormwood—Chemical Composition.—Schimmel & Co. observe that the only constituent of wormwood oil so far determined is *thujone*, while small quantities of terpenes were supposed besides to be contained in the oil. In order to attain some more definite tests than the specific gravity, upon which its purity was heretofore estimated, they have caused some experiments to be made by their chemists with an oil distilled by them in October, 1895. This was of a dark color and had the specific gravity of 0.932. The thujone having been removed from this by suitable methods, and the remainder of the oil subjected to comprehensive experiments by which the presence of *palmitic*, *acetic* and a little *isovaleric acid* was established. A very small fraction boiling at between 158° and 168° was obtained which contained some *phellandrene*, and possibly a little *pinene*. The quantity of terpene present is, however, in any case so small, that any adulteration of this oil with oil of turpentine can be easily ascertained. It suffices to distill from a sample of wormwood oil about 10 per cent., when the distillate should render a clear solution with 2 parts of 80 per cent. alcohol. Failure to produce a clear solution under these conditions is indicative of sophistication.—Pharm. Rev., June 1897, 115; from Schimmel's Rep., April 1897.

Champaca Oil—Characters.—Schimmel & Co. describe the oil of the fresh flower of *Michelia champaca*, L., obtained by them from Manilla. It is the characteristic and exquisite odor of these flowers which has a faint similarity to that of ylang-ylang oil, and it contains, like the latter, some benzoic acid. It is light-brownish in color, sp. gr. 0.938, has a rotatory power of —52.8°, and a saponification factor of 77.3°. While soluble in absolute alcohol, a turbid solution is produced with 10 parts of alcohol

containing 10 per cent. of water. The oil will henceforth be regularly distilled and supplied from Manilla.—Schimmel's Rep., 1897, 11.

Oil of Sandal-wood—Improved Test of Purity.—A. J. Hendrix observes that pure sandal-wood oil which is old, or has been badly preserved, may not give a clear solution with 5 parts of alcohol of 70 per cent. by volume, the test agreed upon by the chemists of Schimmel & Co. and by Umney. He, therefore, proposes the following test as being suitable for use with small quantities: Weigh into a 10 cubic centimeter flask 2 Gms. of a solution of 3 parts of crystallized phenol in 1 part of alcohol, add 0.5 Gm. of the oil, and mix perfectly. Add 0.5 Gm. of concentrated hydrochloric acid without shaking. At the intersection of the liquids there is formed with pure sandal-wood oil a yellow coloration, changing in a few minutes to a bright red. With essence of balsam of copaiba, the upper liquid becomes mauve-colored after a few minutes. With oil of cedar wood, the upper liquid becomes cloudy, and a brownish coloration is developed at the intersection.—West. Drug., June, 1897, 262; from Amer. Soap Journ.

Oil of Elder Flowers—Characters.—Messrs. W. J. Bush & Co. communicate some interesting information concerning the volatile oil of elder flower. It is yielded in very small quantity by elder blossom on distillation with steam. It is solid at ordinary temperatures, having a melting-point of 28° C., and sp. gr. $\frac{30°}{15}$ C. of 0.8277. It appears to consist, like otto of rose, of a liquid portion, to which the fragrance is due, and an inodorous stearoptene, which may be separated by washing with alcohol, in which it is almost insoluble. When purified in the manner employed by Umney for the stearoptene of otto of rose—viz., solution in chloroform and precipitation by alcohol—it was found to have a melting-point of 39.5° C. The rose stearoptene melts at 33° to 34° C., but, according to Schimmel, may be separated into two fractions, one of which melts at 40° C. The stearoptene constitutes 42 per cent. or more of the oil, but very possibly its proportion may be largely influenced by climate, as in the case of otto of rose. The liquid portion has not yet been examined chemically, but has the exact fragrance of fresh elder-blossom.—Chem. Drug., Jan. 9, 1897, 53.

Oil of Basilicum—Chemical Composition.—The chemists of Schimmel & Co. have determined basilicum oil from the island of Réunion to be composed to the amount of 60 per cent. of methyl chavicol, the methyl ether of p-allyl-phenol, the other constituents being pinene, $C_{10}H_{16}$, camphor, $C_{10}H_{16}O$, and cineol. A basilicum oil obtained from the Miltitz experimental farm contained only 25 per cent. of methyl chavicol, while Dupont and Guerlain recently found in French basilicum oil linalool, besides methyl chavicol (or estragol).—Pharm. Rev., May, 1897, 94; from Schimmel's Ber., April, 1897.

Canadian Golden-rod Oil—Constituents.—Schimmel & Co. distilled the

oil of Solidago Canadensis in 1894, and communicated its physical constant in their "Report" of April, 1894. An examination of the oil has recently been made by their chemists, which has shown it to consist of 85 per cent. of terpenes, mainly pinene and much less of phellandrene and dipentene, and perhaps some limonene, the other and higher boiling portions consisting of borneol, borneol acetate, and some cadinene. The total amount of borneol contained in the oil is 9.2 per cent., 3.4 per cent. being in form of acetate. It is remarkable how closely the chemical composition of this oil approaches that of the oil of the needles of the *Pinus* genus, although both are so widely different in their botanical relations.—Pharm. Rev., June, 1897, 115; from Schimmel & Co.'s Semi-Annual Rep., April, 1897.

Oil of Tea—Yield, Character, etc.—Schimmel & Co. observe that they have in former years endeavored, on several occasions, to distil various kinds of tea in order to introduce tea oil, but in no case obtained more than a trace of oil. From a paper in a recent Report on the Botanical Garden in Buitenzorg, Java, however, it becomes evident that this oil does exist, though in very small quantities, 15 kilos of the tea yielding only 1 Cc. (= 0.006 p. c.) of oil. When rolled tea, after having been exposed to fermentation for 3 or 4 hours, is distilled with water, the distillate possesses the strong odor of tea, and by careful cohobation some oil is obtained from the distillate. Besides this oil the distillate contains and will yield some methyl alcohol. The oil has the specific gravity 0.866, a lævogyrate rotation of 0° 11′ in a 200 Mm. tube, and is composed of two portions: one boiling between 153° and 154°, having a somewhat pungent, fusel oil-like odor and the composition $C_6H_{12}O$; the other portion boils at above 170°. The oil is apparently produced by fermentation, and it is remarkable how brief a time is required for its formation. There seems to exist no difference between the oils obtained from Java and Assam tea.—Schimmel's Rep., April, 1897, 39–40.

Oil of Schinus molle, L.—Field and Characters.—Schimmel & Co. have distilled from the aromatic berries of the Schinus pepper-tree—*Schinus molle*, L.—received from Mexico, 5.2 per cent. of a thin oil having the odor of phellandrene, the sp. gr. 0.850, and an angle of rotation of + 46°4′. It furnishes a clear solution with several parts of alcohol. When treated with sodium nitrite and glacial acetic acid in its solution in petroleum-ether, the characteristic phellandrene nitrite is formed. When shaking the oil with sodium hydrate solution, a small quantity of a substance which consists mainly of a fatty acid is obtained; only traces of phenols could be found. Spica (1884) found pepper-tree oil to contain pinene and a phenol which he believed to be thymol on account of its nitrite melting at 156°, but he failed to obtain this phenol in crystals, although thymol readily crystallizes.—Pharm. Rev., June, 1897, 114; from Schimmel & Co.'s Semi-Annual Report, April, 1897.

Oil of Mexican Valerian—Characters, etc.—Schimmel & Co. recently distilled a lot of Mexican valerian roots which had a strong odor of valerianic acid, but in their general appearance little resembled the German root. A sample of the root was submitted to Mr. E. M. Holmes, who is of opinion that it is the root of *Valeriana mexicana*, D. C., which, together with two other species—*V. ceratophylla*, H. B. K., and *V. tolucana*, D. C.—is indigenous to Mexico. The oil could only be obtained after cohobation, when a slight amount separated, having the disagreeable pungent odor of valerianic acid. The specific gravity of the oil is 0.949 at 15°, it is optically inactive and is entirely taken up when shaken with solution of sodium hydrate, leaving only a few flakes. Its figure of acidity was found by titration with alcoholic potassa solution to be 415, corresponding to 89 per cent. of valerianic acid hydrate, $C_5H_{10}O_2 + H_2O$. This species of Mexican valerian root, therefore, yields almost no oil at all, but only free valerianic acid. As the root has the odor of this acid in a marked degree, it seems that it contains the acid in its free state, so that it is not formed in the process of distillation.—Pharm. Rev., June, 1897, 114; from Schimmel & Co.'s Semi-Annual Report, April, 1897.

Oil of Damiana—Characters.—Messrs. Schimmel & Co. have distilled the oil from a consignment of Damiana leaves. The yield was 1 per cent. of oil, having the following properties: Sp. gr. 0.943; optical rotation, 23° 25′; it contained saponifiable constituents, its saponification factor being 41.8. When standing in a cool place, crystalline separations occurred on the surface similar to those initiating the solidification of oil of roses. Damiana oil, therefore, contains a paraffin.—Schimmel's Rep., April, 1897, 15.

Oil of Venezuelan Camphor-Wood.—Schimmel & Co. have distilled the oil from a lot of a Venezuelan wood received from Prof. H. H. Rusby. It occurred in large blocks of a rather soft structure and of a faint odor of borneol; it readily splits and shows a silky lustre somewhat striated by darker longitudinal as well as latitudinal discolorations. For want of flowers and fruits, Professor Rusby was unable to make a botanical determination, but supposes that the wood is derived from a species of

Nectandra or *Ocotea* (Nat. Ord. *Lauraceæ*).—The yield, on distillation, was 1.15 per cent. of a light-colored oil of the very high sp. gr. of 1.155 and the opt. rot. of + 2°40′ in a 100 Mm. tube. The oil has a faint odor of Canada snake root and solidifies to a crystalline mass at common temperatures. When freed from any liquid portions by means of filtration and subsequently dissolved and recrystallized from alcohol, fine, colorless prisms are formed, melting at 28.5°. The crystalline mass is soluble with dark-red color in concentrated sulphuric acid; when this solution is poured into water, brown flakes are separated. When boiled with an alcoholic solution

of potassium hydrate, a compound is formed, crystallizing from its alcoholic solution in fine plates melting at 55° to 56°. These products and reactions are conclusive that the crystalline portion of the Venezuelan camphor-wood oil, amounting to 90 per cent., consists of *Apiol*, which, on further observation, proved to be identical with common parsley apiol.—Pharm. Rev., June, 1897, 114; from Schimmel & Co.'s Semi-Annual Report, April, 1897.

Apiol—A Liquid Form from Dill Oil.—Ciamician and Silber have extracted from dill oil a liquid apiol, boiling at 285° C., which has the same composition as the crystallizable apiol from parsley oil ($C_{12}H_{14}O_4$), and differs from it only in structure. By reaction with sodium ethylate dill-apiol yields a crystalline isoapiol, which is analogous to the isoapiol obtained from parsley-apiol, melting at 44° C., and boiling at 296° C.—Pharm. Journ., Oct. 31, 1896, 378; from Berichte, xxix., 1799.

Thiosinamine—Use as a Palliative in Malignant Tumors.—Dr. Sinclair Tousey has experimented with thiosinamine as an injection into malignant tumors, and finds it to give good results as a palliative.—N. Y. Med. Jour., 1896.

Ionone—Preparation.—According to Duyk, ionone may be prepared as follows: Into a stoppered flask are introduced 65 Cc. of acetone, 50 Cc. of citral, and a litre of saturated baryta water. The mixture is shaken together for several days, then extracted with ether. The ethereal residue, after evaporating the solvent, is then distilled under reduced pressure (12 Mm.), the portion passing over between 130° to 155° being reserved; this is then treated with a current of steam to remove impurities, and again fractionated under reduced pressure, the part distilling 138° to 155° being kept. This is heated on the water-bath with 100 parts of water, 2½ parts of sulphuric acid, and 100 parts of glycerin. After cooling, the liquid is again extracted with ether, the ethereal liquid evaporated, the residue distilled under 12 Mm. pressure, and what comes over between 125° to 135° is ionone.—Pharm. Journ., Nov. 7, 1896, 406; from Journ. de Pharm. d'Anvers, iii., 278.

Iodol—Value in Laryngeal Ulceration.—Dr. Hajek uses iodol in laryngeal ulceration of tubercular origin, applying it directly to the parts. Its slight solubility allows the powder to adhere to the ulcerated surfaces, and it acts as a marked detergent; under its influence the ulcer assumes the appearance of a granular wound. As it adheres for three or four days to the surface, two insufflations a week will generally suffice.—Pharm. Journ., Aug. 22, 1896, 174; from Therap. Wochenschr.

Raphanol—A Volatile Crystalline Body from Raphanus Niger.—H. Moreigne has obtained a new volatile crystalline body, which he calls raphanol, by subjecting the roots of *Raphanus niger* to slow distillation with water. It passes over with volatile oil, from which it is separated by

recrystallization from ether. Pure raphanol forms white, pearly, odorless, microscopic crystals, m. p. 62°, insoluble in water, in alkali and in weak acids, but readily soluble in ether and chloroform, and also in the volatile oil with which it is associated. In its ultimate composition it is found to have the molecular formula $C_{29}H_{58}O_4$, and in its general behavior, determined as far as the small amount of material would permit, it corresponds to lactone—a body which has been found by the author in other crucifers, such as the radish, turnip, water-cress, and scurvy grass.—Pharm. Jour., July 25, 1896, 61; from Jour. de Pharm. (6) iv., 10.

Oil of Bitter Almond—Volumetric Estimation of Hydrocyanic Acid, etc.—Edward Kremers and O. L. Schreiner suggest the following volumetric method, based upon Vielhaber's, for the direct estimation of hydrocyanic acid in bitter almond oil: 1 gram of the oil is weighed off accurately into a small Erlenmeyer flask, and 10 Cc. of a mixture of magnesium hydrate with water and a few drops of potassium chromate solution are added. Titration with $\frac{N}{10}$ silver nitrate solution is then effected very slowly until the red silver chromate formed indicates the end of the reaction, the mixture being continually agitated so as to bring the oil into intimate contact with the solution. From the amount of silver solution required, the hydrocyanic acid may be readily calculated, every Cc. of $\frac{N}{10}$ silver nitrate solution corresponding to 0.0027 Gm. hydrocyanic acid.

Applying this test to a sample of oil known to be genuine, and to five commercial samples, the astounding fact was revealed that none of the commercial samples of bitter almond oil contained any hydrocyanic acid whatever, whereas the genuine sample contained 4.45 per cent. It was further shown by their examination that, while the genuine oil was free from chlorinated compounds, each of the five commercial samples contained chlorine. It is evident, therefore, that the commercial oils examined were not true bitter almond oil, but the

Artificial Benzaldehyde of commerce, which is prepared from benzal chloride, $C_6H_5CHCl_2$, and as a rule more or less impure from the presence of chlorinated compounds, which give to the oil a pungent, repulsive odor and highly unpleasant taste. For the detection of chlorine present as mono- or di-substitution products of benzaldehyde and benzyl alcohol, or as benzyl chloride, etc., the following method of Schimmel & Co.: A small quantity of the oil is oxidized with a warm alkaline solution of potassium permanganate, any excess of the latter being decomposed by the addition of a few drops of alcohol. The mixture is filtered and the filtrate acidified with pure, dilute sulphuric acid. Upon cooling, the separated benzoic acid—which contains the chlorine substitution products in the form of chlorinated benzoic acid—is carefully washed on a filter, then dissolved in pure potash solution, a little nitre added, evaporated to dryness, and finally heated to incineration in a platinum dish. The incinerated residue, dissolved in water and acidified with nitric

acid, gives the reaction for chlorine, when tested by silver nitrate, if chlorinated compounds were present in the samples.

To detect alkyl chlorides, the following method is recommended: 5 to 10 Gms. of the oil are heated to boiling in a distilling flask and the first 10 to 12 drops of the distillate are caught in a 5 per cent. alcoholic potash. The alcoholic liquid is heated for a time in a flask connected with a reflux condenser; then the alcohol is volatilized, the residue heated with water, and the oily constituents removed by shaking out with ether. The aqueous liquid is warmed a short time in a dish, acidified with nitric acid, filtered when perfectly cool from the separated benzoic acid, and the filtrate tested for chlorine. With slight modifications both methods may be used for quantitative estimation. Concerning the

Commercial Bitter Almold Oil examined by the authors, they observe that they all contained large quantities of free benzoic acid, which crystallized out when the oils were subjected to a temperature lower than that of the room, showing the oil to be nearly saturated with benzoic acid. The results of examination are given in form of a table.—Pharm. Rev., Sep., 1896, 196–198.

Oil of Bitter Almond—Fallacy of Kremel's Reaction for its Distinction from Cherry Laurel Oil.—Sigmund Charas records the details and results of an investigation made to determine the value of Kremel's method for distinguishing between the volatile oils of almond and of cherry laurel. The method depends upon the observation of Kremel that benzoïn is produced when bitter almond oil is boiled with alcoholic potassa solution, but not when cherry laurel oil is treated in the same way, and he believed this distinction to be due to a difference in the nature of the benzaldehyde contained in the two oils. The investigation of Charas now seems to prove that the latter view is incorrect, that the difference noticed is not due to the nature of the benzaldehyde, but to the quantity of hydrocyanic acid; and that this being the case, the distinction between the two oils would be more exact and greatly simplified by determining the amount of hydrocyanic acid as silver cyanide. In the absence of hydrocyanic acid no benzoïn is formed, and none is formed in true bitter almond oil that is deficient in this; while cherry laurel oil, containing much hydrocyanic acid, produced benzoïn with equal facility to the bitter almond oil rich in hydrocyanic acid. The problem of distinction between the two oils is therefore not yet solved.—Zeitschr. Oest. Apoth. Ver., July 20, 1896, 549–551.

ALCOHOLS AND DERIVATIVES.

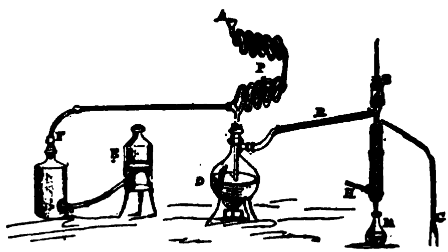
Polyhydric Alcohols—Compounds with Borates.—See *Boric Acid*, under "Inorganic Chemistry."

Alcoholic Fermentation—Production without Yeast Cells.—E. Buchner states that the separation of fermentation from the living yeast cell had not

been accomplished heretofore, but he now reports a method by which this could be accomplished. Beer-yeast was deprived of all possible external moisture and triturated with quartz sand and infusorial earth. The resulting magma yielded under great pressure a filtrate, which, even when filtered through a sterilized Berkefeldt infusorial earth filter, caused fermentation in concentrated solutions of cane sugar, glucose, fructose and malt sugar. No fermentation was caused in concentrated solutions of milk sugar and mannitol. Neither are solutions of these two substances fermented by the living yeast cell. As to the nature of the substance in solution that causes the fermentation, further experiments are to be made.—Pharm. Rev., May 1897, 96; from Berichte, *30*, 117.

Alcohol—Preparation from Acetylene.—The following description of the apparatus necessary and the production of alcohol from acetylene gas is translated from "Le Monde Moderne" for the Scientific American by J. Colton Lynes. In a flask, *F*, (Fig. 61), calcium carbide and metallic

FIG. 61.



zinc are placed: knowing that zinc when attacked by water acidulated with sulphuric acid gives hydrogen gas in the presence of water, we see here that the calcium carbide freely evolves acetylene gas. In the flask, *E*, put, then, water and a little sulphuric acid and connect this flask with the first by a flexible tube, so that, when *E* is elevated or lowered, we may introduce or withdraw, at will, liquid in the flask, *F*, according to the need of the production. The acetylene and the hydrogen, developing at the same time, do not fail to seize the opportunity for combining. In the nascent state bodies always have a greater affinity for each other than at a later stage. It is of this marriage, then, that the ethylene is born, which, being now disengaged, goes over into the glass worm, *P*, where it comes in contact with concentrated sulphuric acid heated to 80° (Centrigrade), which is slowly poured into a funnel, *A*; it is here that it gets its oxygen. It now forms a new body, which is ethyl-sulphuric acid. This is collected in the flask, *D*, and is brought into ebullition. Here it is decomposed into sulphuric acid, which remains, and may be used again, and into alcohol, which evaporates but is collected and condensed by means of tube, *R*, connecting with worm, *B*, surrounded by a current of cold water circu-

lating from *H* to *C*. In *M* is collected an alcohol absolutely pure, which industrially produced would not cost more than 20 centimes (4 cents) per liter. It contains none of those essences which are always present in the vegetable alcohol, and which render them dangerous for consumption.—Amer. Drugg., Jan. 11, 1897, 7.

Alcohol—Not a Source of Error in Volumetric Analysis if Pure.—Referring to the paper of Charles Caspari, Jr., on "Alcohol as a source of error in the titration of alkaloids and alkaloidal residues" (see Proceedings 1896, 190–197), Lyman F. Kebler communicates the details and results of experiments made by himself and Mr. C. H. LaWall during the past year and a half, which show conclusively that while commercial alcohol does exert a disturbing influence in volumetric analysis with all the indicators employed, it is clearly evident that *pure* alcohol does not vitiate the accuracy of volumetric determinations, except in the cases of methyl-orange and tropœolin OO. Iodo-eosin and fluorescein also appear to be affected, but their end-reactions are so gradual and indistinct that no importance can be attached to the variations of these indicators.—Amer. Jour. Pharm., Dec., 1896, 667–675.

In a rejoinder to the paper of Mr. Kebler, Mr. Caspari states that having carried out a series of titrations with *strictly pure* alcohol prepared by himself, using hæmatoxylin, Brazil wood and cochineal as indicators, he can fully corroborate the statement made by Mr. Kebler, that satisfactory results can be obtained with *such* alcohol quite as well as with water.—Ibid., Jan., 1897, 42-43.

Oil of Cognac—Manufacture from Wine-Lees.—A manufacturer gives some interesting information concerning cognac oil. He observes that the peculiar aroma of all kinds of wine is due to oil of cognac, but that oil does not impart the boquet of the wine. It is formed in the process of fermentation, the bulk of it being lodged in the wine-lees which form a precipitate at the bottom of the cask, while that retained by the wine is very small—only 0.00004 per cent. The cheapest material is the compressed wine-lees in cakes, which is best treated in the following manner, the plant required being an ordinary distilling-plant as used in spirit-distilleries, but fitted with stirring-apparatus. The raw material is placed in the still with the addition of five times its volume of water, 2 per cent. of newly-slaked lime, 1 per cent. of potash, and 1 per cent. of common salt. The stirring-apparatus is then set in motion, and steam is allowed to pass directly through the contents for about four or five hours at a gradually rising temperature up to 240° C. The oil in combination volatilizes with the steam, condenses in the cooler, and flows into a large container placed below. Owing to its lower sp. gr. (0.820), the oil floats on the surface of the alcoholic water, and when the process is completed it is drawn off; the alcoholic water may be preserved for separate treatment. The yield from 35 cwt. of compressed lees is about 640 grammes of crude green-colored

oil of cognac. This for the manufacture of fine qualities of cognac has to be refined, but answers for ordinary grades, and for making essences, and is known as grade C. When rectified by carefully neutralizing the free fatty acids and separating the copper which is present in it, the resulting oil is of an olive-yellow color, and is well known in commerce as grade "B." If necessary, this variety is again rectified once or twice, yielding thereby the water-white oil "A," which is the purest and best known in trade, and of which 1.8 or 2 grammes suffice to impart to 100 litres of 50 per cent. rectified spirit, the characteristic odor and taste of the best cognac. In the present state of our knowledge it is not possible to give a satisfactory analytical process for the examination of oil of cognac. The best means of judging the quality is the preparation of a quantity of cognac and its examination according to aroma and taste after one or two years' keeping.—Chem. & Drugg., Jan. 30, 1897, 183.

Cognac Essence—Composition.—Dr. E. Polenske has examined a cognac essence, introduced by F. W. Mellinghoff, and apparently used largely in making artificial brandy. It is a dark reddish colored fluid, having a sweetish taste and a grape-like odor. When cognac is prepared with it by the formula given by the manufacturer, this has the color of genuine cognac but the odor and taste only remind of the latter. The sp. gr. of the essence is 1.036, and its composition as follows: Alcohol, 41.24 per cent. (vol.); fusel oil, 0.59 per cent.; free acetic acid, 0.039 per cent.; free fatty acids of the higher wine, 0.015 per cent.; acetic ether, 0.058 per cent.; grape oil (the odorous constituent), 0.066 per cent.; extract 26.76 per cent.; ash, 0.02 per cent.; cane sugar, 19.76 per cent.; invert sugar, 1.77 per cent.; caramel, not estimated. A second sample examined gave figures not essentially different from these. The sp. gr. was somewhat lower (1.0262) and the alcohol per cent. somewhat higher (44.68 per cent).—Pharm. Ztg., Jan. 16, 1897, 45.

Chloroform—Cheap Method of Manufacture.—A new method for making chloroform is now practiced on a large scale, and is said to be quite cheap. It consists in replacing one Cl in tetrachlor methane (CCl_4) by H, and is carried out by subjecting 75 parts of tetrachlor methane to the action of 60 parts of hydrochloric acid of 22° B. and 50 parts of metallic zinc. Two mol. H produced by the action of the acid on the zinc react with the CCl_4, producing chloroform ($CHCl_3$) and regenerating hydrochloric acid. The regenerated hydrochloric acid acts on a fresh portion of zinc, and the process continues thus until the tetrachlor methane is completely converted into chloroform.—Merck's Rep., Dec. 1, 1896, 634.

Iodoform—Advantageous Preparation.—Dr. Eschbaum, at the meeting of the German Pharmaceutical Society (1896), observed that when equal volumes of tincture of iodine and soda solution—such as is commonly

used as reagent—are mixed and heated during several minutes, the mixture becomes colorless and evolves the odor of iodoform, but very little iodoform is deposited. If then the liquid is diluted with water, the separation of the iodoform is so copious as apparently to pervade the entire liquid. The author expresses the opinion that under these conditions a larger yield of iodoform may be secured than by the method heretofore pursued, the addition of water preventing the decomposition of the iodoform by the free alkali present.—Ztschr. Oest. Apoth. Ver., Jan. 20, 1897, 51.

Iodoform—Easy Solubility in Allyl Sulphide.—N. Allegre has found that iodoform is easily soluble in its own weight of allyl sulphide. Used hypodermically, the allyl sulphide is rapidly absorbed, while the iodoform is absorbed more slowly. The allyl sulphide being eliminated chieflly by the lungs, there is reason to believe that during absorption it carries a certain quantity of iodoform with it, and the author, therefore, thinks that such a solution might prove of service in the treatment of pulmonary tuberculosis.—Merch's Rep., Dec. 15, 1896, 664; from Sem. Med., xvi., 230.

Methæthyl—A New Local Anæsthetic.—Dr. G. Henning has made an examination of a local anæsthetic recently introduced under the name "methæthyl," and finds it to consist largely of ethyl chloride with small quantities of methyl chloride and chloroform. It was found to boil at 10.5° to congeal at —30°, and to have the sp. gr. of 0.9173 at 4°. When treated with alkalies it is slowly decomposed into ethyl alcohol, hydrochloric acid, and formic acid.—Pharm. Ztg., 1897, 200.

Formaldehyde—Production in Gaseous Form.—The incomplete combustion of methyl-alcohol yields, according to André Brochet, only a small quantity of formaldehyde, accompanied by a large quantity of water and a notable proportion of carbonic oxide. The author finds the preparation of gaseous formaldehyde to be best accomplished by passing a current of hot gas over coarsely powdered trioxmethylene. The dilution of the aldehyde prevents polymerization, and the absence of water vapor makes it possible to apply the method to the disinfection of books, papers, and other articles that would be injured by moisture.—Pharm. Review, Aug., 1896, 184; from Compt. rend., cxxii; 201.

Formaldehyde—Properties and Uses.—F. C. J. Bird gives a review of the history and uses of formaldehyde. He describes the 40 per cent. solution of formaldehyde as met with in commerce as being a liquid of a pale sea-green tint, specific gravity about 1.070, acid in reaction, and possessing a pungent and very characteristic odor. The acidity is due to formic and acetic acids, and the faint sea-green tint to the presence of a salt of copper. The 40 per cent. solution is the strongest practicable, since in more concentrated solutions the formaldehyde passes into the polymeric and comparatively in active form. When exposed to the air, formaldehyde

vapors gradually diffuse, and the solution loses strength. The vapor so diffused exercises remarkable preservative properties, it sufficing to expose meat, fish, etc., in a well covered dish with a tuft of cotton-wool moistened with from 4 to 8 drops of the 40 per cent. solution, to preserve them during the hottest months. The author enumerates the purposes for which formaldehyde is used, and the effects produced, in the form of a table. He also reviews in some detail the qualitative tests that have been prepared for its detection, which have become important because of the growing use of formaldehyde as a preservative for milk and other substances to which it is added direct. For there is as yet little known concerning its toxity, and there is no proof recorded that it is a harmless substance; though Dr. Rideal is said to have taken a considerable quantity of a 1 per cent. solution witout experiencing any ill effects.—Pharm. Journ., Sept. 26, 1896, 269–271.

Formaldehyde—Detection and Determination.—G. Romijn is of opinion that formaldehyde may best be recognized by conversion into hexamethylamin by means of ammonia, the transformation taking place at ordinary temperature during twenty-four hours, and more rapidly at higher temperature. For the estimation of pure solutions of formaldehyde the iodometric method is to be preferred, on account of its great accuracy and convenient execution. The methods of Brochet and Cambier and the potassium cyanide method may also be recommended. But if the presence of other aldehydes is to be feared the potassium cyanide method is suitable, and, along with the iodometric method, will in many cases permit of the entire analysis of the mixture. Legler's method will never bear a comparison with the other three methods.—Chem. News, Feb. 5, 1897, 70–71; from Ned. Tijdschr, von Pharm. Ch. en Tox., through Ztschr. Anal. Chem., xxxvi., P. 1.

Formic Aldehyde—A Delicate Test.—Dr. Lebbin finds that the red condensation product formed with resorcin by formic aldehyde affords a very delicate test for its determination. About 0.05 Gm. of resorcin is added to a few cubic centimeters of the solution suspected to contain formic aldehyde, an equal volume of a 50 per cent. caustic soda solution is added, and the mixture is heated to boiling. The yellowish color of the mixture then becomes permanently deep red, the reaction being very marked in the presence of one-millionths of formic aldehyde, and manifests itself even in water containing the ten-millionth part. Other bodies do not appear to produce this reaction.—Pharm. Ztg., 1896, 681.

Formalin—Test for its Presence in Milk.—Richmond and Boseley recommend a test for the presence of formalin in milk, which is dependent upon the observation that if a small portion of the milk be diluted with an equal volume of water and strong sulphuric acid of 90 to 94 per cent. cautiously added, a violet ring is formed at the line of separation; whereas, in

the case of pure milk, free from formalin, a greenish tint is given at the line of separation and a brownish color develops after some hours, not at the juncture of the liquids but lower down in the acid.—Pharm. Journ., Aug. 15, 1896, 154; from Analyst, xxi., 93–95.

Formaldehyde—Color Reactions with Phenols.—H. Endeman finds that while formaldehyde and phenols unite to form colorless bodies, when these are treated with a dehydration agent, like zinc chloride or sulphuric acid, colored bodies are formed which are characteristic. In order to produce the reaction the phenol is dissolved in commercial formaldehyde, on the cover of a crucible, the solution is evaporated at a low temperature, not quite to dryness, and some concentrated sulphuric acid is added. The following color reactions have been obtained:

	THE SOLID.	THE SOLUTION.
Phenol	Fuchsin-colored	Fuchsin-colored.
Salicylic acid	Red	Fuchsin-colored.
Eugenol	Brown with shade of Bordeaux.	
Carvacrol	Orange to orange red.	
Guaiacol	Violet, quickly brownish-violet.	
Resorcin	Scarlet-red	Orange.
Hydroquinone	Brown	Brown.
Thymol	Faintly fawn-colored (due to impurity?).	
α-Naphthol	Green	Brown.
β-Naphthol	Green, then black	Green.
Pyrogallol	Red.	
Hematein	Red, then brown.	
Tannin	No reaction.	

This reaction is not confined to formaldehyde, but is likewise produced by other aldehydes. The colors, however, differ; for instance, phenol and benzaldehyde give brown solid and brownish-yellow solution. While we may therefore use formaldehyde as reagent for phenols, we may also use the phenols as reagent for formaldehydes.—West. Drug., June, 1897, 264.

Formaldehyde—Use as a Preservative of Vegetable Infusions.—F. C. J. Bird has communicated to the Brit. Pharm. Conference the results of experiments made to test the utility of formaldehyde for preserving vegetable infusions, for which it seemed to be particularly suited on account of its reputed germicidal action, the absence of odor or taste in dilute solutions, its non-poisonous nature, and its volatility. He considered it particularly applicable to the preparation of concentrated aqueous solutions, such as liquid ergot for instance, by the process of re-percolation, but was disappointed in this because of the pertinacity with which formaldehyde is retained by aqueous liquids, making it almost impossible to remove the last traces by evaporation. Its preservative effect upon the B. P. *infusions of senna*, *of calumba*, *of gentian co.*, and *of ergot* (the latter made with cold

water) was also tried, the results being given in four tables, showing the daily changes during seven days under varying conditions: (1) Without addition; (2) Exposure of 10 fluidounces of the sample to the vapor from 1 minim of formaldehyde solution on a tuft of cotton suspended by means of a wire passing through the cork; (3) the same as (2), using 5 minims of formaldehyde solution; while in (4) and (5), the formaldehyde solution was mixed directly with the infusion in proportion of 1 and 5 minims respectively to 10 fluidounces. These results show that by the use of formaldehyde vapor, mouldiness is either slight in amount or absent, while when the formaldehyde is added directly to the infusion, the growth of mould is very conspicuous and advances rapidly. The use of formaldehyde as vapor has the further advantage that much less of the antiseptic actually remains in the infusion, for at the end of a week the cotton still retains a strong formaldehyde odor. One minim of formaldehyde solution suspended in the manner stated over an infusion, will preserve it for two or three days under the most adverse conditions, while 5 minims will keep it for a week or more; and used in this manner, it is in the author's opinion quite free from objection as a preservative for infusions.—Yearbook of Pharm., 1896, 336–339.

Formic Aldehyde—Superiority as Disinfectant over Sulphurous Acid.—Dr. Winter Blyth is convinced that formic aldehyde gas is superior to sulphurous acid as a disinfectant. Comparative trials of pieces of linen on which were cultures of the bacilli of diphtheria, typhoid and anthrax, by exposure to the two gases in separate rooms during nineteen hours, were made by Professor Macfadgen, with the result in the case of diphtheria bacillus, no growths developed under exposure to either gas, and none in the case of the typhoid and anthrax bacillus in the presence of formic aldehyde, while in the presence of sulphurous acid good growths had formed.—Pharm. Jour., May 29, 1897, 469.

Formalin—Application in Dentistry.—According to Abraham, formalin has given excellent results in the after treatment of the root canal after cautery of the pulp, for the preservation of a tooth with gangrenous pulp, and for the preparation of roots before affixing crown. It is applied in the following manner: a powder is made of calcium sulphate, 6 ounces; mercury bichloride, 1 drachm, mixed finely: and a liquid consisting of sulphuric acid, 2 ounces; formalin, 3 ounces; distilled water, 3 ounces. A little of the powder is mixed on a glass plate with sufficient liquid to form a paste which, introduced into the previously-dried canal, solidifies in a few minutes. The crown can then be filled with any desired stopping.—Therapist, vi., 50; from Berl. Thierärtzl. Woch., 1896.

Amyloform—A New Compound of Formaldehyde.—Dr. A. Classen has patented a method for preparing a chemical compound of formaldehyde with starch which he has named "amyloform." It is decomposed in con-

tact with the secretions and tissues under liberation of formaldehyde, and is consequently regarded valuable in the treatment of wounds, arresting the secretions with greater energy than does iodoform. It is stated to be odorless, innocuous and non-irritant, and is a strong deodorant.

Amyloform gauze is also prepared. It may be sterilized without decomposition of the amyloform at a temperature up to 180° (C. or F.? Rep). —Zeitsch. Oest. Apoth. Ver., Aug. 10, 1896, 599.

Dextroform—Superiority over Amyloform.—It is stated in Merck's Report (Mar. 1, 1897, 145) that dextroform, a condensation product of dextrin with formaldehyde, will yield its formaldehyde more readily than amyloform, since it is freely soluble in water.

Formaldehyde-Casein—A New Antiseptic.—Dr. E. Bohl has subjected formaldehyd-casein, a new condensation product of casein and formaldehyde, to clinical experiment, and finds it upon the whole to possess but feeble antiseptic properties, its action being similar to that of glutol. It is supplied in the form of a coarse yellowish powder, and possesses neither a marked taste nor odor.—Ztschr. Oest. Apoth. Ver., Oct. 20, 1895, 792.

Carbolic Acid—American Source of Supply.—It is not generally known that the crude carbolic used in America for making carbolic acid, is imported exclusively from England by a Philadelphia dealer, who supplies American manufacturers. This crude acid is described as 60, 70 or 80 degrees, meaning that a certain portion will crystallize at that temperature. The liquor is derived from the dead oils of coal-tar by agitation with an aqueous solution of sodium or potassium hydrate. It has approximately the following composition: Crude phenol, 62.74; crude cresol, 14.09; rosolic acid, hydrocarbons, naphthalene, and its dihydrid and tetrahydrid derivatives, bases, parvoline, coridine, rubidine, 12.13; water, 11.04. In this connection attention may be called to the fact that the crude carbolic acid of the market as sold to-day is not what it purports to be, and quite different from that of former times. Formerly, crude carbolic acid was the liquor remaining after the extraction of the phenol, leaving water-insoluble but still valuable cresols. Since the latter have attained such great mercantile importance, however, they also are carefully removed from the liquor, leaving scarcely anything but stinking tars, absolutely worthless for disinfecting purposes. It is now necessary to order "crude cresol" to obtain an equivalent for the former crude carbolic acid.—Western Drug., Feb. 1897, 74.

Carbolic Acid—Determination of Absolute Phenol.—Chas. F. Palmer and L. E. Sayre have experimented with the official (U. S. P.) and other methods suggested for the determination of the absolute phenol in carbolic acid, and from the results obtained conclude the following method to be the best one: The carbolic acid was converted into a sulphocarbolic acid. This was treated with barium carbonate, which neutralizes the excess of

sulphuric acid and forms a soluble sulphocarbolate of barium. The solution is filtered to free it from excess of barium carbonate and barium sulphate, and the clear filtrate treated with sodium carbonate. Sodium sulphocarbolate is formed and barium carbonate precipitated. The following are the reactions:

$$2C_6H_5OH + 2H_2SO_4 = 2C_6H_5SO_4H + 2H_2O.$$
$$2HC_6H_5SO_4 + BaCO_3 = Ba(C_6H_5SO_4)_2 + H_2O + CO_2.$$
$$Ba(C_6H_5SO_4)_2 + Na_2CO_3 = 2NaC_6H_5SO_4 + BaCO_3.$$

From 1 gram of carbolic acid 1.049 Gm. of barium carbonate would be obtained if the acid were absolutely pure. The percentage of phenol is determined by proportion.—Drug. Circ., July, 1896, 158–159.

Phenol—Estimation in Soaps and Disinfectants.—Prof. Virgil Coblentz recommends the following method for determining the carbolic acid in soaps and disinfectants. The solutions necessary are:

1. Solution containing 9.763 Gm. cryst. sodium thiosulphate in the liter.
2. Bromine solution containing 2.04 Gm. of sodium bromate and 6.959 Gm. of sodium bromide in the liter.
3. Filtered solution of starch.

The sodium thiosulphate solution is standardized by means of pure iodine and from this the bromine solution is standardized. The solution containing the phenol to be titrated should not contain more than 0.1 Gm. to each 25 Cc. The distillation should be carried on in a flask of 600 Cc. capacity, and as receiver a flask of 500 Cc. A sample of soap containing 0.1 Gm. of phenol, dissolved and acidified with sulphuric acid, required distillation in a current of steam for one-half hour until all of the phenol was driven over into the receiver. To 0.1 Gm. of phenol from 85 to 150 Cc. of bromine solution were added and the mixture allowed to stand for one-half hour. To this was added a freshly-prepared solution of 1.25 Gm. of potassium iodide in 30 Cc. of water, the flask securely stoppered and allowed to stand 12 hours, when it was titrated with the sodium thiosulphate in order to estimate the amount of liberated iodine. —Amer. Drug., Sept. 25, 1896, 195; from Alumni. Jour.

Phenol—Determination in Soaps, etc.—H. H. Fresenius and C. J. S. Maker observe that the determination of phenol in pure aqueous solutions and its estimation in crude carbolic acid present no special difficulties if Koppeschaar's volumetric method—in the latter case as modified by Tóth—is followed; but its determination in soaps and disinfectants is in some cases attended with considerable difficulties. The authors therefore consider the following method prepared by Charles Lowe and given in Allen's "Commercial Organic Analysis," as being worthy of notice: A weighed quantity of the soap is dissolved in hot water, and hydrochloric acid is then added until it predominates. The fatty acid set free is then filtered off. The phenol is determined in the filtrate either gravimetrically

as tribrom-phenol, or volumetrically, according to Koppeschaar or Tóth. From the experiments quoted, it appears that the proportion of phenol in disinfectants can be determined relatively expeditiously, and with an accuracy sufficient for practical purposes.—Chem. News, Oct. 16, 1896, 197; from Ztschr. Anal. Chem., 1896, Part 3.

Carbolated Lime—Preparation.—M. Proskauer recommends the following formula for preparing carbolated lime: 8 parts crude carbolic acid and 10 parts gypsum are triturated together; the mixture is then carefully mixed with 80 parts of pulverized calcium hydrate, and spread out in thin layers in the air until it becomes red, when it is preserved in well closed vessels.—Ztschr. Oest. Apoth. Ver., Sept. 20, 1896, 712.

Bismuth Sulphocarbolate—Characters and Uses.—Hugh Woods states that he has prepared and used, in a considerable number of cases, the sulphocarbolate and the oxybromide of bismuth (see under Bismuth), and found them to have special advantages in certain cases over other compounds of bismuth. Bismuth sulphocarbolate is a purple-red powder, and has been used very successfully in cases of fever with foul-coated tongue and offensive breath. It is said to be excellently suited for cases of irritative dyspepsia, with fermentative changes in the food, deranging digestion; and a trial of it is strongly recommended in typhoid fever and generally as an intestinal disinfectant.—Merck's Rep., April 1, 1897, 212; from Brit. Med. Jour.

Omal—A New Inhalant.—Under the name "Omal," trichlorphenol has been introduced as an inhalant in inflammatory conditions of the air passages.—Merck's Rep., Mar. 1, 1897, 145.

Ethylene Diamine Cresol—A New Antiseptic.—Dr. Schaefer has experimented with ethylene diamine cresol, which is described as a colorless fluid, free from poisonous properties, and possessing remarkable penetrant qualities when applied to the skin. It has been used with pronouncedly satisfactory results in the treatment of ulcerous processes. In its application to the suppurating wounds it has proven of particular value, and fully the equal in its healing properties to iodoform, aluminum acetate, silver-nitrate salve, etc. On the other hand it is relatively inefficient in gonorrhœa, eczema and psoriasis.—Zeitschr. Oest. Apoth. Ver., Oct. 20, 1896, 791.

Creosote Valerianate—A New Remedy.—Gustav Wendt has introduced the valerianic acid ester of creosote, under the trade name of

Eosot as a remedial agent in tuberculosis and as a disinfectant remedy for intestinal troubles. It has been employed clinically by Dr. E. Gracitz with very satisfactory results. It is a mobile, non-corrosive and non-poisonous fluid, and is administered in form of capsules containing 0.2 Gm. of the medicament, as many as nine being given in some cases as a daily dose.

Guaiocol Valerianate has also been introduced, as a substitute for pure guaiacol and the carbonate, under the trade name of

Geosot.—It is used in the same doses and for the same purposes as the before mentioned creosote valerianate.—Zeitschr. Oest. Apoth. Ver., Aug. 1, 1896, 572–573.

Creso-Magnesol—A New Creosote Combination.—Romeyer and Testevin have devised a compound of creosote and magnesia, which they have named "creso-magnesol," as follows: Twenty parts of caustic potash are dissolved in 10 parts of water in a porcelain mortar. To this are gradually added and emulsified, 800 parts of beech creosote, and finally 170 parts of freshly-calcined magnesia are worked in. The mass left at ordinary temperature gradually deepens in color, and at the end of thirty-six hours is of good pilular consistence. Later it sets, so that it may be readily powdered, and in this powdered form is easily massed into pills with a little honey. This powder contains 80 per cent. of creosote. A similar compound may be obtained with pure "guaiacol," by using only 10 per cent. of magnesia and potash together. A pulverulent mass is speedily obtained, which contains 90 per cent. guaiacol.—Pharm. Journ., Dec. 26, 1896, 545; from L'Union Pharm., xxxvii., 489.

Guaiacol—Solubility in Water.—Harold Wyatt observes that guaiacol is usually looked upon as being insoluble in water, or nearly so. He has made experiments which show that 1 part of guaiacol, sp. gr. 1.124, is soluble in 70 parts of water at 15.5° C., so that practically 48 minims may be dissolved in 8 fluid ounces of water. If required to be given in larger doses than can conveniently be administered in form of solution of this strength, it may be given in hard capsules; but for this purpose it must be diluted with some fixed oil, as, by itself, it rapidly dissolves the hard capsules used in dispensing.—Chem. and Drug., Oct. 31, 1896, 643.

Guaiacol—Simple Method of Distinction from Creosote.—S. Vreven recommends the following simple method for distinguishing between guaiacol and creosote: A drop of the liquid to be examined, 2 to 3 drops of ether, and 1 or 2 drops each of concentrated nitric and hydrochloric acids are well shaken together in a test tube. The mixture assumes at first a red-brown color, which is particularly evident in the ether layer; but upon the spontaneous evaporation, well-formed needle-shaped crystals will separate out if guaiacol is present, the formation of these crystals being facilitated by occasional shaking, whereas in the presence of creosote oily globules only separate. While carbolic acid gives a similar reaction to that of guaiacol, the crystals formed are easily distinguished from the needles produced by the latter.—Zeitschr. Oest. Apoth. Ver., Sept. 20, 1896, 711; from Monit. de la Pharm., 1896, 549.

Guaiacol Phosphite—Preparation and Character.—Ballard prepares a compound of phosphorus and guaiacol as follows: 124 grammes of crystallized guaiacol is treated with 50 grammes of caustic soda dissolved in 00

per cent. alcohol; to the clear solution phosphorus trichloride is run in through a tapped funnel until the solution is no longer alkaline to phenolphthalein; the precipitated salts are filtered out, the alcohol is distilled off, and the residue extracted with absolute alcohol, which only dissolves the phosphite of guaiacol. The solution is then evaporated on the water bath and the salt crystallized out, purified by recrystallization from absolute alcohol, and finally dried over sulphuric acid. The crystals have the formula, $P.(C_6H_4:OCH_3.O)$, and therefore represent the neutral phosphite of guaiacol. It forms a white crystalline powder, melting at 77°.5. Creosote treated in a similar manner gives a thick, reddish-yellow liquid which consists of the phosphorous esters of the various phenols present in the creosote; to this the author proposes to give the name "phosphatol."—Pharm. Journ., May 1, 1897, 368; from Répertoire de Pharm., [3], ix., 104.

Guajacetin—A New Substitute for Creosote in Tuberculosis.—Prof. von Noorden has treated numerous cases of phthisis in all its stages with guajacetin and reports upon it very favorably, and as being superior to both creosote and guaiacol in so far as its taste and freedom from disturbing effect upon the digestive organs is concerned. The new compound is produced by the introduction of a carboxyl group into the methyl group of guaiacol, thus, forming pyrocatechin-mono acetic acid $= C_6H_4.OCH_2.OH_2.COOH$. It is administered in doses of 0.5 Gm. several times daily.—Zeitschr. Oest. Apoth. Ver., July 10, 1896, 533; from Ther. Wochenschr.

Piperidine Guaiacolate—Preparation, Composition and Uses.—Dr. Schidrowitz has prepared piperidine guaiacolate by the interaction of piperine and guaiacol in a suitable solvent, such as benzene or petroleum ether. It crystallizes in prismatic needles or plates, is sparingly soluble in water—to the extent of 3.5 per cent.—but easily soluble in the organic solvents. Its composition is represented by the formula $C_5H_{11}N.C_7H_8O_2$. In order to test its value in phthisis, for which the remedy has been particularly recommended, Drs. Arnold Chaplin and F. W. Funncliffe had chosen fourteen cases more or less at haphazard. The general conclusions arrived at were, that piperidine guaiacolate is a perfectly safe drug in doses of 5 to 30 grains three times a day; its administration is not attended by unpleasant effects; it is exceedingly well borne on the stomach, and patients while under its influence usually improved in appetite and general strength. The temperature in most cases never receded to normal.—Merck's Rep., March 1, 1897, 146; from British Med. Jour., 1897, 136.

Resazurin—A New Indicator from Resorcin.—Weselsky had previously given the name *diazoresorcin* to a compound obtained by the action of nitric acid upon resorcin, but has now changed the name to *resazurin*, because it does not posses the characteristics of the diazo-compounds, and the former name would therefore be misleading. It is prepared by dissolving 4 Gm. of resorcin in 300 Cc. of anhydrous ether, and then adding 40 to 45 drops of nitric acid (sp. gr. 1.25), saturated with nitrous anhy-

dride. This latter product is obtained by the action of nitric acid on starch. On standing for two days in a cool place, blackish crystals having a brownish-red reflection are deposited, from which the red liquid, holding in solution resorufin and two other nitro-resorcins, is decanted. The crystals are then washed with ether, and finally with water, until the washings are colored blue by ammonia. The composition of resazurin is $C_{12}H_7NO_4$. It is but slightly soluble in water, more so in alcohol, and very freely in acetic ether. Its aqueous solutions are colored blue by alkalies or alkaline carbonates, and become red on adding acids. A solution of this salt has been proposed for alkalimetrical use, by dissolving 0.2 Gm. in 40 Cc. of decinormal ammonia water and adding enough water to make a liter. This 1 : 5000 solution is intensely blue in color, red by transmitted light, and permanent; 2 or 3 drops suffice to color 200 Cc. of water a sky-blue. This indicator is said to be specially serviceable in titrating decinormal solution of sodium borate. The molecular weight of this salt, purified by crystallization from its hot solution and subsequent drying in air ($Na_2B_4O_7.10H_2O$), is 380.91; therefore, 19.045 Gm. are required for 1 liter of water. Such a solution exactly neutralizes, volume for volume, a decinormal solution of pure oxalic acid made from 6.285 Gm. of acid to the liter. Neither litmus nor phenolphtalein will answer in titrating borax. Resazurin does not indicate accurately with nitric acid; nor is it better than litmus or orange No. 3 for titrating monobasic organic acids. Like litmus and phenolphtalein, but in lesser limits, it is sensible to the action of carbonic acid.—Merck's Report, July 1, 1897, 333; from Rep. de Pharm., vii., 208.

Resorcin—Value in Dermatology.—Dr. Hartzell considers that the merits of resorcin are not sufficiently recognized in the treatment of skin diseases; it possesses such marked sedative and keratoplastic properties as to render it specially valuable in those diseases in which itching and burning are prominent symptoms. Judiciously applied to eczema, preferably in watery solution of ten to fifteen grains to the ounce, it gives excellent results, the sedative effect being increased by the addition of a halt per cent. of sodium chloride. In erythematous eczema the following lotion is recommended: Resorcin, 10 to 15 grains; glycerin, 15 minims; lime water, 1 fluid ounce. To be dabbed, not rubbed, on the surface for five minutes three or four times a day: where there is abundant serous discharge, half a drachm of bismuth subgallate may be added to the above. When the skin becomes dry and scaly, the following paste may be used: Resorcin, 10 to 15 grains; starch powder and zinc oxide, of each 2 drachms; petrolatum, half an ounce. Resorcin also relieves the pain in ulcers from varicose veins when applied in an ointment of 5 to 20 grains in the ounce. In psoriasis it gives good results, but must be used in greater strength, such as in an ointment of 30 to 40 grains per ounce. In seborrhæa capitis the following wash is efficient: Resorcin, 20 grains;

rectified spirit, 2 drachms; liquid petrolatum, 6 drachms. To be rubbed into the scalp with the fingers or with a small sponge every other night. It should not be prescribed for patients with very fair hair, as it causes a slight discoloration. In epithelioma resorcin often acts in a remarkable way in promoting cicatrization, for this it used in the following plaster: Resorcin, 72 grains; yellow wax and powdered resin of each half an ounce; olive oil a sufficiency.—Pharm. Journ., July 25, 1897, 79; from Therap. Gaz., (3), xii., 363.

Resorcin—Use as a Prophylactic Against Diptheria.—Binet recommends resorcin as a successful prophylactic against diphtheria contagion. He recommends that the mouth and nose be rinsed night and morning with a 0.5 per cent. solution of resorcin. It is free from unpleasant taste, and more energetic in its action than boric acid and other similar disinfectants heretofore recommended.—Zeitschr. Oest. Apoth. Ver., Aug. 10, 1896, 600.

Glycerin—Contamination with Arsenic.—E. L. Patch having been requested to examine some fluid extracts to which arsenical poisoning had been traced by a physician, and suspecting that the poison was introduced by the glycerin employed in their manufacture, examined samples of C. P. glycerin of various makes, English and American, and found that all responded to tests for arsenic. This observation agrees with the statement of a prominent manufacturer, which is interesting, and therefore given here in full:

"It is impossible to obtain a glycerin absolutely free from arsenic. We have had ours tested several times, and the most obtained is 0.0002 per cent., equivalent to one-thousandth of a grain in an ounce, or one-tenth of a grain in a gallon. This small quantity cannot do any harm. We have spent much time and money in efforts to eliminate this minute trace of arsenic, coming from the pyrites sulphuric acid, but in vain. We have examined the "C. P." glycerin of every maker in the United States, England, France, and Germany, and have yet to find a sample that does not contain at least a trace of the article, although in some cases it is guaranteed by the manufacturer to be free from arsenic."

Prof. Patch, in order to confirm this statement, arranged a series of tubes with Gutzeit's test; several containing glycerin and other solutions of arsenous acid in distilled water, corresponding to $\frac{1}{10}$, $\frac{1}{30}$, $\frac{1}{50}$, $\frac{1}{80}$ and $\frac{1}{100}$ grain to the gallon. Those containing $\frac{1}{10}$ grain of arsenic to the gallon gave evidence of its presence within five minutes. Those containing $\frac{1}{100}$ grain to the gallon required over an hour. All makes of glycerin tried showed the presence of arsenic, but in quantity not exceeding $\frac{1}{10}$ grain to the gallon, while one of American and one of English origin contained only abont $\frac{1}{100}$ grain to the gallon. The quantity mentioned by the manufacturers, 0.0002 per cent., corresponds nearer to one-seventh than to one-tenth of a grain per gallon, a quantity that in a fluid extract containing 20 per cent. of glycerin, can scarcely exert any marked activity.—Merck's Rep., Aug. 15, 1896, 403.

Glyceryl Borate—Constitution, Characters, and Uses.—Truman Griffen has made some experiments to determine the constitution of glyceryl borate, about which comparatively little has been written. By prolonged heating of 46 Gm. of anhydrous glycerin and 31 Gm. of powdered boric acid—being molecular proportions—in a retort, at not exceeding 150° C., the distillate (water) weighed 25.5 Gm., and the residual boro-glyceride 51.5 Gm. In this reaction, the tribasic orthoboric acid replaces the three hydroxyl equivalents of the molecule of glycerin, with the evolution of water. The exact yield of boroglyceride should have been therefore 50 Gm., and of water 27 Gm. Boroglyceride is a solid, vitreous body, transparent, of slight amber color, and faint astringent taste. It is hygroscopic, dissolves freely in glycerin, forming a permanently clear solution when it is melted with an equal weight of glycerin, and is also soluble in water and in alcohol, but is decomposed into its component parts when an excess of the water is added. The author recommends it as a general antiseptic, for which it is well adapted both on account of its efficiency and its innocousness. A suitable strength of its solution is from 2 to 5 per cent.—Proc. Minn. State Pharm. Assoc., 1896, 119–120.

FIXED OILS.

Fixed Oils—Detection of Resin Oils.—Cornette recommends a method for the detection of resin oils fraudulently mixed with vegetable oils, which is dependent upon the fact that salts of the resin acids are not precipitated by "salting out." Ten grammes of the suspected oil are saponified with caustic soda; the soap obtained is dissolved in warm water, cooled, and a saturated solution of salt added; the salts of the fatty acids are thrown out, but the resinates remain in solution. The liquid is filtered and acidulated with sulphuric acid, when the resin acids are precipitated in small globules, giving a milky liquid, or floating on the top in small discs. These may be collected and weighed.—Pharm. Jour., Nov. 7, 1896, 406; from Répertoire [3], vii., 300.

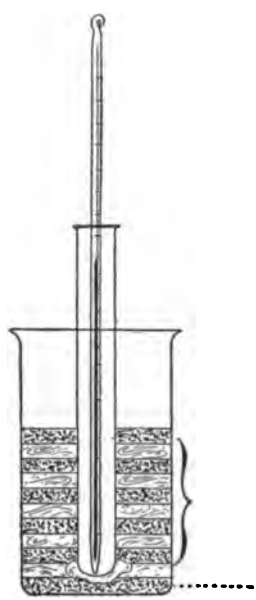
Fats—Process of Rancidification.—Ed. Spaeth sums up the results of his experiments on the rancidification of fats as follows: I. In the rancidification of fats (hog's lard), which must be regarded as a process of oxidation chiefly occasioned by the action of light and of atmospheric oxygen, the unsaturated body acids (oleic acid) are chiefly attacked with the formation of acids with a low percentage of carbon. There is also a formation of aldehydic bodies and of oxy-fatty acids. II. With the progress of oxidation and the formation of free acids the volatile acids undergo a very great increment. III. All the acids participate in the formation of the free fatty acids. IV. With the increasing oxidation of the fats, their absorptive power, as well as the iodine number, undergoes a corresponding decrease, which diminution is effected by an oxidation and decomposition of the non-saturated fatty acids and by their poly-

merization. Such oxidized fats exhibit in the refractometer a decidedly higher deflection than do normal fats. The increase in the deflection is decidedly due to polymerization of the non-saturated fatty acids. V. Fats which have become rancid have in general a higher melting-point than recent fats.—Chem. News, Oct. 16, 1896; from Zeit. Anal. Chem., 1896.

Fatty Oils—Outline of Systematic Examination.—In a paper read before the Liverpool Pharmaceutical Students' Society, R. C. Cowley gives a concise description of the various steps and processes necessary for the systematic examination of fatty oils. To this end, the following determinations are considered by the author as the most important: 1, Specific gravity; 2, Melting and solidifying points; 3, Melting and solidifying points of the fatty acids: 4, Behavior with solvents; 5, the Hehner value; 6, the Reichert-Meissl value; 7, the saponification value; 8, the iodine value. These and other determinations are carefully described and may be referred to in the author's paper in Pharm. Jour., April 17, 1897, 331.

Fats and Oils—Identification by Means of the Heat of Bromination.—Wm. Bromwell and Joseph L. Mayer report some improvements on the method of recognizing fats and oils by the rise in temperature produced on the addition of 1 Cc. bromine to 1 gramme of the oil, as suggested by Hehner and Mitchell in the *Analyst*, July, 1895. In place of the expensive Dewar's vacuum jacketed tube employed by the latter, the authors have conveniently used a cheaper device, shown by Fig. 62. It consists of a beaker with about one-fourth of an inch of calcined magnesia in the bottom, and a test-tube about 7 inches in length, around the bottom of which is wrapped a small piece of cotton; this is then put in the beaker and imbedded in alternate layers of cotton and calcined magnesia, being packed quite tight so that the tube can be withdrawn and replaced at pleasure without disturbing the nest so made. A centigrade thermometer graduated to fifths of a degree completes the apparatus.

FIG. 62.

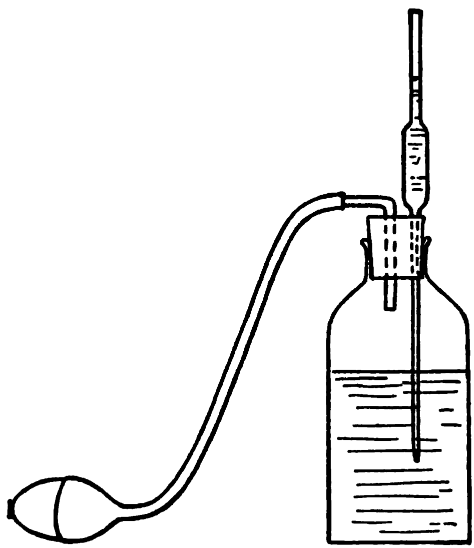


Beaker.

On account of the difficulty of handling the bromine, it has already been suggested by Dr. Wiley that it be diluted with 4 times its volume of chloroform instead of adding it directly to the oil. But the authors find that even with this precaution the reaction with some oils is so violent that a dilution of the oil, made by dissolving 1 Gm. in sufficient chloroform to make

5 Cc. of solution, is also recommended and employed by them. Of the bromine solution only sufficient for a day's supply should be made. A quantity of the oil solution sufficient for a number of experiments may, however, be made with advantage; but it is necessary to measure this accurately and carefully, using a glass-stoppered burette, and avoiding any loss by contact with the walls of the test tube during the flowing in. On the other hand, the bromine being largely in excess of the amount required, the 5 Cc. of solution need not be so accurately measured. The authors have adopted for this purpose Dr. Wiley's apparatus for measuring it, which is shown by Fig. 63. This is simply a wash bottle arrangement; through one opening in the stopper a pipette—graduated to 5 Cc.—passes nearly to the bottom, through the other a short tube, which connects on the outside with an atomizer bulb. The pipette is, by pressure on the latter, easily filled to the 5 Cc. mark, and is then withdrawn under the usual precautions.

FIG. 63.



As the action of the bromine on the oil is instantaneous, it is necessary to have the thermometer in the oil solution before adding the bromine. It is, furthermore, found advantageous to add the bromine solution slowly, consuming about half a minute. In this manner the authors have determined the rise of temperature occasioned by bromine in a large number of oils, and communicate the average result of four determinations of each sample in a table, showing also the results obtained by Dr. Wiley and by Hehner and Mitchell with such oils as were reported upon by them.—Amer. Jour. Pharm., March, 1897, 145–149.

Isanic Acid—A New Fatty Acid.—Alex. Hébert has obtained from the oil of I'sano seeds—which are derived from a large tree belonging to the family *Olacineæ* in the Loango country—three fatty acids, two of them apparently identical with oleic and linoleic acids respectively, the third one a white solid, present in the proportion of about 10 per cent. It occurs in fine leafy crystals, fusible at 41°, very soluble in strong alcohol, ether, chloroform, benzene, acetone, methylic alcohol, and petroleum ether. Its composition is $C_{14}H_{20}O_2$.—Chem. News, July 21, 1896, 49; from Compt. rend., No. 26, 1896.

Eunatron—A New Cholagogue.—Dr. F. Blum calls attention to "Eunatron," which is simply the trade name for pure "sodium oleate." It is a white powder, melting at a low temperature, and quite free from the rancid taste of the commercial article. It is dispensed in capsules or chocolate-coated pills containing 0.25 Gm. and is recommended by Dr. Blum as a valuable cholagogue, preferable to sodium salicylate, as well as the salts of the biliary acids.—Merck's Rep., March 1, 1897, 145.

Aluminum Oleate—Preparation of a Solution.—The "Pharm. Post" (1896, 540), describes a solution of aluminum oleate, which is prepared as follows: A solution of an oil soap is added to an alum solution; the sticky mass, which is precipitated, is triturated with warm water, and while still moist is dissolved in ether. It is intended to be a substitute for "traumaticin," which is a concentrated solution of gutta percha in chloroform.

Cotton-Seed Oil—Question of Quality.—Theo. D. Wetterstroem, speaking of cotton-seed oil in connection with "camphor liniment" (which see under "Pharmacy"), expresses the opinion that the orange yellow cotton-seed oil, known in commerce as "clarified cotton-seed oil" is preferable, on account of its deeper color, to the official oil, which is of a "pale yellow." It answers every official requirement except that of color, and he thinks the deeper color is an advantage, since it produces a liniment which is markedly different in color from castor oil, for which the liniment made from the lighter colored official oil might, under circumstances, be mistaken.—West. Drug., Feb., 1897, 68.

Cotton-Seed Oil—Objections to its Use for Pharmaceutical Purposes.—After a prolonged trial of commercial cotton-seed oil as a substitute for olive oil in ointments, liniments, and other applications for external use. Wm. Elborne states that on the authority of an eminent therapeutist its use has been abandoned, since in some cases it produced decided irritant effects. He exhibited before the Brit. Pharm. Conf. (1896), a sample of commercial oil which has produced the unfavorable effect, and two other samples used previously, against which there were at the time no complaints.—Year-Book of Pharm., 1896, 333.

Oil of Arachis—Detection in Olive Oil.—Prof. Chas. Blarez observes

that the detection of oil of sesame, cotton-seed oil, etc., in olive oil is not a matter of any great difficulty, but the problem of detecting the presence of oil of arachis is always a matter of delicacy. The method of Renard for detecting this adulterant has the fault of being too long and requiring great experience on the part of the persons using it. He therefore proposes a new and much quicker method, based on the property its potash soaps posses, of being almost insoluble in strong, cold alcohol, in presence of a notable excess of potash. The originality claimed consists in the special procedure followed and the use of very simple apparatus, and may be briefly described as follows: 1. Pour 1 Cc. of the oil under examination into a test-tube 15 Cm. long. 2. Add 15 Cc. of pure 90 per cent. alcohol, containing 4 or 5 per cent. of pure potash. 3. Fit the tube with a vertical condenser. 4. Heat the tube carefully for about 20 minutes; the oil will rapidly saponify and disappear, the alcohol returning into the tube. 5. Remove the condenser, cork the tube and put it in a cool place. In the case of pure oil of arachis the contents of the tube became solid after the lapse of twenty-four hours. With pure olive oil there is no sign of solidification after the lapse of twenty-four, forty-eight, or even seventy-two hours; but with a mixture of the two there is always a flocculent precipitate, in which can be distinguished crystals of potassium arachidate.—Chem. News, May 21, 1897, 251; from Bull. Soc. de Pharm. de Bordeaux, April, 1897.

Sesame Oil—New Test of Identity.—T. Soltzien recommends the following test for determining the identity of sesame oil or detecting it in admixtures: Two or three parts of the oil to be tested are warmed in a test tube in a boiling water-bath, and one part of a solution of stannous chloride in hydrochloric acid (1 : 19—Bettendorf's test) added, the whole vigorously shaken once, so that an emulsion is formed, and the test tube immediately replaced upright in the boiling water. The stannous-chloride solution rapidly settles to the bottom, colored from a bright raspberry-red to a dark wine-red, according to the amount of sesame oil present. When but very small quantities of sesame oil are present the color first produced may fade away entirely if the shaking be repeated, but the red coloration is still clearly visible when 1 per cent. of sesame oil is present. Other oils do not yield this reaction.—Pharm. Centralh., 1897, 195.

Oil of Saw Palmetto—Characters and Coefficients.—Ferd. A. Sieker has obtained from 12 to 13 per cent. of fixed oil from fluid extracts of saw palmetto, one of them having been prepared by himself from the ground dried mature fruit. He prepared some of the oil in October, 1895, using alcohol as a solvent, which was examined in March, 1897. This oil, separated from other matters extracted by the alcohol by decantation and filtration, was deep green, had the sp. gr. 0.9138 at 15° C., was soluble in alcohol and in ether, and almost completely soluble in petroleum ether. It congealed at about 14° C., did not solidify after 3 or 4 days' contact with

nitric acid and copper filings, had an iodine number, according to Hübl's method, of 41.86, an acid number of 175.26, and an ester number of 37.23, these two making the saponification number 212.49. Its solubility in alcohol distinguishes this oil from most oils, while the iodine number distinguishes it from castor oil, which has a coefficient of 84.4 according to Hübl. Another sample prepared with alcohol in March, 1897, gave the iodine number 41.7, while a sample prepared with petroleum ether in Aug., 1895, gave the iodine number 43.38, an acid number of 149.13 and an ester number of 68.32, making the saponification number 217.45. This last oil was almost perfectly soluble in alcohol.—Pharm. Rev., June, 1897, 113.

Linseed Oil—Sophistication with Paraffin Oil.—Prof. E. L. Patch examined a sample of linseed oil having a sp. gr. of 0.900 at 15° C., instead of 0.933. It contained 28.4 per cent. of a product not saponifiable by alcoholic solution of soda. Treated with concentrated sulphuric acid and the mixture thrown on water, a paraffin separated. Pure oil would entirely carbonize under this treatment. Evidently a cheap paraffin oil was present.—Merck's Report, Aug. 15, 1896, 403.

Chinese-Wood Oil (Tung Oil)—Characters and Comparison with Linseed Oil.—W. H. Deering records the results of an examination of a sample of tung oil, with the view of obtaining some preliminary information as to how it would compare with linseed oil, and if it seemed likely to be suitable for the manufacture of linoleum. The oil had the following characteristics: Color, golden yellow, clear and viscous; odor, that of a seed oil; specific gravity at 60° F., 0.9405 (water at 60° F., 1). It is a glyceride oil, giving on saponification 96½ per cent. of fatty acids, which, at ordinary room temperature, are hard and very crystalline. It required 1.18 per cent. of potassium hydrate for neutralization of its free acid, and 19.12 per cent. for total saponification. Raw linseed oil usually contains only about one-fifth that amount of free acid (a point of no importance as regards any practical application); the total potash required for saponification of raw linseed oil averages from about 18.8 per cent. to 19.1 per cent. of potassium hydrate, being practically the same number as with the tung oil. The bromine absorption is 98 per cent. bromine. With ½ per cent. each of litharge and red lead, and heated to 500° F., it jellifies readily, forming a semi-solid, elastic and slightly sticky mass, the solidification being more rapid without air than where air is blown in. The opacity of oxidized tung oil is against its employment in varnish-making, but its properties in other respects are such as seem likely to make it a valuable material in the manufacture of linoleum.

Croton Oil—Characters and Co-efficients of a Fresh Sample.—Ferd. A. Sieker prepared some croton oil by expression from the seeds of *Croton Tiglium*, and describes it as a thick yellow liquid, possessing the sp. gr. of 0.9445 at 15° C. It is soluble in ether, carbon disulphide, petroleum ether,

and chloroform. The iodine number, in two estimations, was determined to be 107.01 and 108.01, respectively; the acid number, 196.7 and 192.4. Owing to the dark color produced by boiling with alcoholic potash, these figures are not entirely satisfactory. The iodine number of another sample of the oil, prepared by exhausting the crushed seed with petroleum ether, was 110.6. The method adopted by the author for the

Determination of the Iodine Number was that given in "Helfenberger Annalen," 1892, p. 3, and is as follows: About 0.3 Gm. of oil was brought into a 500 Cc. flask provided with a glass stopper, 20 Cc. of chloroform and 30 Cc. of alcoholic iodo-mercuric chloride solution were added and the mixture set aside for 24 hours. Twenty cubic centimeters of 10 per cent. solution of KI and 200 Cc. of water were then added and the excess of iodine determined by titration with $\frac{N}{10}$ $Na_2S_2O_3$, of which 50 Cc. were required for 30 Cc. of the iodo-mercuric chloride employed—a blank experiment being made side by side with the sample.—Pharm. Rev., June, 1897, 113.

Oil of Pumpkin Seed—Percentage, Yield, Character, etc.—See *Cucurbitus Pepo*, under "Materia Medica."

Coco-Nut Oil—Digestibility.—Bourot and Jean have experimented on coco-nut oil deprived by pressure of the greater part of its soluble glycerides, and find that, other things being equal, the digestibility of the vegetable butter thus prepared is equal to 98 per cent., as compared with that of cow's butter at 95.8 per cent. During the experiments the cow's butter regimen showed a greater tendency to disorder the system than that of the coco-nut butter, being accompanied by eructations and diarrhœa. The specimen of coco-nut oil used had been purified by a special process, and was termed "taline." It melted at 31°, and contained only 1.156 per cent. of soluble glycerides, whereas ordinary coco-nut oil melts at 23°, and contains about 7 per cent. of soluble glycerides.—Pharm. Journ., Oct. 31, 1896, 380; from Comptes rendus, cxxiii., 587.

Cacao Butter—Iodine Number and Index of Refraction.—A. Strohl finds that the iodine number of pure cacao butter of different origin, degree of ripeness, etc., varies from 32.8 to 41.7, while the indices of refraction, determined at 40°, vary from 1.4565 to 1.4578. A cacao butter having a low iodine number will have as a rule a low index of refraction.—Chem. News, Aug. 28, 1896, 109; from Ztschr. Anal. Chem., 1896, No. 2.

Oil of Egg Yolk—Character.—Lecanu has subjected the oil obtained from hard-boiled eggs by heat and pressure to examination. It is limpid when warm, becoming turbid on cooling, with deposition of a sediment containing a cholesterine fusing at 145° C. The density of egg oil at 20° C. is .915, it solidifies at 8° to 10° C., is soluble in ether, insoluble in alcohol, its saponification number is 185.2 to 186.7, and the iodine number 81.21 to 81.60. Color reactions are difficult to read owing to the intense yellow

tint of the oil.—Pharm. Journ., Aug. 22, 1896, 174; from Giornale di Farmacia e di Chimica.

Butter—A New Test for Oleomargarine.—Dr. B. Alexander-Katz has devised a simple apparatus (shown by Fig. 64) for testing butter for oleomargarine, the method of examination being based upon the observation that even slight additions of oleomargarine cause butter to become so opaque, after twice melting, that a mark on the containing vessel cannot be distinguished through the molten fat. In this tester the word "Butter" is burned into the glass with blue color. After melting the suspected butter twice, an observation is made through a slit whether the word "Butter" is distinctly visible in the light reflected from the shining metallic walls of the apparatus. With pure butter, even when old or rancid, the letters are usually distinctly legible, while this is not the case in the presence of but slight traces of oleomargarine. The apparatus, either for single observation or for a number of them at the same time, is constructed by Max Kaehler and Martini, Berlin.—Pharm. Rev., Feb., 1897, 32.

FIG. 64.

Wool fat—Utility for Ointments.—Frank Edel gives the results of his experience with wool fat as an ointment base. He observes that for a number of years he had used the wool fat known in commerce by the trade name "lanolin," but has recently been induced to experiment with a commercial wool fat bearing the official name "Adeps lanæ," which, however, is not hydrous as required by the U. S. P., but an anhydrous article, and differs both in appearance and in melting point from the "lanolin" of the market. Nevertheless, this Adeps lanæ is a product which deserves attention and use as an ointment base. It is odorless, and the most rigid tests show no signs of oxidation. It mixes readily with oils and readily takes up as much as 300 per cent. of water; while when combined with 3 times its weight of petrolatum, it will mix with 3 or 4 times its weight of glycerin. The author pertinently observes that it seems strange that the revisers of the Pharmacopœia should have adopted a product containing *not more than 30 per cent. of water* when an anhydrous product was so easily obtainable. The useful application of wool fat to ointments is pointed out in different directions, and it is held by the author that *pure anhydrous wool fat* can be used with advantage in many more combinations than is at present the case.—West. Drug., Jan., 1897, 13.

Beeswax—Analysis.—R. Clode Guyer has read an exhaustive paper on beeswax analysis at a recent meeting of the Chemical Assistants' Association, London, which is reproduced in "Pharm. Jour." (Oct. 31, 1896, 384–386, and Nov. 21, 1896, 445–446), in which he gives a lucid descrip-

tion of the various processes that are necessary to establish the identity and purity of a sample. These processes are not so difficult as they are tedious, since no single test is available by which the purity of a sample of beeswax can be determined with certainty. But while any one who has had a general chemical training can perform any of the necessary tests, an accurate opinion as to the result requires what only time can give—experience. Neither the determination of the melting point, which may range from 62.5° to 64°, nor the specific gravity, which may have the limits of 0.962 and 0.966, can be accepted as proof of purity, since the wax can be manipulated with adulterants and still respond to these conditions; on the other hand, a considerable divergence from these figures must be regarded as a proof of impurity. The most valuable information, however, is obtained by the determination, according to Hübl's process, of the three great chemical constants, viz.: Acid value, 20; ester value, 75; and saponification value, 95. Deviation from these numbers will necessitate general and special examinations for adulterants—such as paraffin, Japan wax, Carnauba wax, tallow, stearic acid, by processes which are pointed out in the author's paper.

Beeswax—Iodine Value.—In his paper above quoted, R. Clode Guyer had expressed doubt as to the correctness of the published figures referring to the iodine value of beeswax, viz., 9.6 to 10. He now records experiments made to determine the iodine value of eleven authentic samples of English yellow beeswax from five localities, in which he found the lowest value to be 7.9 and the highest 8.9, the average figure being 8.5. He thinks, therefore, that the iodine value of *yellow* beeswax should be taken as 8 to 9. He, furthermore, regards this test to be of distinct analytical advantage, especially when taken in conjunction with other constants. Thus a beeswax, adulterated with 5 per cent. paraffin, gave 7.7; with 10 per cent., 7.3; and with 20 per cent., 6.5 as the iodine value, whereas the pure yellow wax gave an iodine value of 8.15. Again, in the case of tallow, resin, and other similar substances having a high iodine value, this is increased over the normal in wax adulterated with them. A yellow wax showing an iodine value of 9, showed 10.7 with 5 per cent., 12.5 with 10 per cent., and 16 with 20 per cent. of added tallow. Japanese wax, a fairly frequent adulterant of beeswax, has a low iodine value of 4. Carnauba wax is slightly higher.

The author emphasizes that the foregoing observations refer entirely to the yellow beeswax, and that *white* beeswax does not lend itself to this test, since the body or bodies which are capable of absorbing iodine are generally greatly reduced and even obliterated in the bleaching, particularly when the bleaching is effected by chemical means.—Pharm. Journ., April 10, 1897, 303.

Japan Wax—Adulteration with Starch.—Charles H. La Wall calls attention to the frequent adulteration of Japan wax in recent years with

starch. He examined fifty-nine cases containing from 205 to 225 pounds of the wax each, and found twenty-five of them adulterated to the extent of from 20 to 25 per cent. with starch, being a total of about 1,200 pounds of adulterant paid for at the price of Japan wax. The presence of starch was detected only in lots purchased from agents or brokers and not in lots of direct importation, making it evident that the adulteration was practiced after shipment from Japan. The appearance of the sophisticated product differed slightly from that of the genuine wax, the specific gravity was slightly higher, and it was, in most instances, free from the peculiar network of minute cracks which usually cover the surface of a cake of pure Japan wax. The quickest and most effective method of detecting the presence of starch consists in scraping the surface of a fresh fracture slightly with a knife and applying a few drops of iodine test solution. In the absence of starch the stain produced will be simply that of the iodine, but if starch is present a deep bluish-black is developed after fifteen minutes' time. Quantitatively the starch was determined by the saponification number of the sample, which for the pure wax is 220.98, and by dissolving the sample in chloroform, which leaves the starch undissolved. Fairly concordant results were thus obtained.—Amer. Jour. Pharm., Jan. 1897, 18–21.

Spermaceti—Examination of Pure Specimens.—Referring to a previous paper in which he had endeavored to establish the characters of pure spermaceti (see Proceedings 1896, 775), Lyman F. Kebler observes that he has secured specimens of spermaceti from the Pacific coast, from New Bedford, Mass., and other centers of supply of the United States, partly through the intervention of professional friends—W. M. Searby, E. L. Patch, J. P. Remington and W. R. Scoville—and partly by direct appeal to the producers. He records the results of the examination of eleven specimens so secured, together with a twelfth specimen obtained by melting together several samples taken from a purchase of 2,000 pounds. The melting-points, acid numbers and ether numbers correspond very closely with those obtained last year. Concerning the specific gravity of spermaceti, the author observes that it is liable to vary, when the determination is made upon the solid substance, according to the method pursued in preparing the specimen or the medium in which the weighing is done. These various methods are described; but he recommends that the sp. gr. be taken at the boiling point of water, which gives the most uniform and concordant results, and is carried out as follows: Pour the melted spermaceti into the warmed pycnometer, insert the stopple and plunge the bottle immediately into boiling water, to such a depth that the neck of the bottle only projects. Keep the water boiling for one hour, remove the bottle, wipe well, cool and weigh. This gives the weight of a given volume of spermaceti at the temperature of boiling water. The conclusions arrived at in the previous article (*loc. cit.*) are fully supported by the author's ob-

servations made in the present communication, except the specific gravity of the solid material. To this constant a greater degree of variableness must be ascribed, depending entirely on the crystalline or non-crystalline condition of the spermaceti operated on.—Amer. Journ. Phar., Feb. 1897, 104–107.

Phytosterine (Vegetable Cholesterine)—Import of Color Reactions, etc.—H. Thoms, after giving O. Hesse's definition of phytosterine and reviewing the history of vegetable cholesterines, reports the results obtained by the application of Liebermann's and Hesse's reactions upon cholesterine from gall-stones, upon phytosterine (vegetable cholesterine) from the following substances: Cotton-seed oil, grass leaves and belladonna leaves, and upon β-amyrin, cinchol, onocol, onoketone, resin acid from onoketone, a bietic acid, and benzo-resinol. The results point out that the so-called cholesterine reaction cannot be due to the alcoholic character of this class of substances. Phytosterines are defined by the author temporarily as those high molecular, unsaturated alcohols of the vegetable kingdom which give color reactions like those or similar to those of cholesterine, and whose formation is caused by like physiological processes in the vegetable organism.—Archiv. d Pharm., 235, (Jan. 1897), 39–43.

CARBOHYDRATES.

Cellulose—Soluble Derivatives.—Messrs. Cross, Bevan, and Beadle, in a paper read before the Royal Photographic Society, London, review the various uses to which cellulose has been applied in photography, and describe the methods of obtaining its various soluble derivatives. These are divisible into two classes:

A. Compounds obtained by direct treatment with solvents, the cellulose being in aqueous solution as a species of double salts; and these are divisible again into three kinds: (1) *Neutral* (zinc chloride), (2) *Acid* (zinc chloride and hydrochloric acid), (3) *Basic* (cuprammonium compounds).

B. Compounds previously prepared by synthetical reactions with alcoholic OH groups. These again are divisible into two groups—(1) Sodium hydrate and carbon disulphide. Synthesis of sulphcarbonate in two stages. Solutions aqueous, and, of course, alkaline; (2) Acid esters of cellulose: Compounds of "neutral" properties. Nitrates, benzoates. Soluble in ether, alcohol, acetone, chloroform, glacial acetic acid, etc.

Cellulose as the colloid medium for the photosensitive substance, has of late years given place largely to its rival gelatin. It includes a number of natural products of different constitution, and in the group of derivatives which may be formed from it, we have a substance which may be studied under a range of suitable variations. It is with the object of suggesting methods of manipulating various forms of the substance, the details of which will readily occur to those familiar with the technicalities of the art,

that the authors have communicated their present paper.—Pharm. Journ., Aug. 15, 1896, 141–144.

Pyroxylin, B. P.—Improved Formula.—In a paper read before the Br. Pharm. Conference, Charles T. Tyrer observes that in conducting a considerable number of experiments in the manufacture of pyroxylin on a large scale, it was found that most formulas given in text-books were either unreliable in themselves or wanting in precise directions. The B. P. formula, whilst producing a very soluble pyroxylin if properly worked, is unfortunately lacking in details of such preciseness as to enable one to achieve this good result without preliminary experiment. The author has sought to overcome these objections by experiments, which are given in detail in the form of a table, the following formula giving a fair yield and forming a good collodion, which is somewhat less fluid than the B. P.:

Cotton wool	200 grains.
Acid, sulphuric, 1.845	8 fluid ounces.
Acid, nitric, 1.450	4 fluid ounces.
Water	1½ fluid ounces.

The temperature of the mixed acids should be 162° F.; then, on adding the water, the temperature should be allowed to cool to 150° F., the cotton immersed (allowing 30 seconds for this), and allowed to remain immersed during 2 minutes and 20 seconds. It is then transferred to a perforated porcelain dish, thoroughly and quickly pressed with a pestle, then thrown into not less than three gallons distilled water, and rapidly stirred, drained, again pressed, and re-washed until free from acidity and the wash-water is free from sulphates; then dried at a temperature of 90° F., the pyroxylin being first wrung out as dry as possible and picked.

The process given is unsuitable for larger batches, unless modified; certainly the batches should not be larger than the quantity given in the U. S. P., which, the author states, appears to be a better process than that of the B. P., being perfectly soluble and forming a slightly more gelatinous colodion. The yield by the above process is 278 grains.—Year-Book of Pharm., 1896, 344–347.

Tetra-nitro-cellulose—A New Explosive.—H. N. Warren observes that when dinitro-cellulose, or ordinary soluble pyroxylin, is further acted upon by means of a mixture composed of equal parts by volume of nitric acid 1.5 density, and concentrated sulphuric acid, there is, as is well known, produced a true trinitro compound, differing entirely from either of the above compounds as regards its solubility, and at the same time possessing far enhanced explosive properties. If the resulting compound thus formed is again treated with a still more energetic dehydrating agent, composed of equal parts by weight of commercial vitriol and phosphoric anhydride, a further nitrogenous compound is obtained, which, after the usual washing and drying, presents a much more brittle structure than any of the

preceding derivatives, in some cases even admitting of pulverization, and altogether a much more formidable compound, even exploding by mere percussion, its explosive violence as compared with the former bodies being more than double. When the compound is digested in a strong solution of potassium chlorate, and carefully dried, it is rendered extremely brittle, and thus readily admits of being pulverized, forming a true percussion agent. As far as can at present be ascertained, the new explosive represents a tetra-nitro compound; but owing to its formidable explosive properties, necessitating considerable care in handling the same, further investigations are considered necessary, in order to arrive at a correct formula.—Chem. News, Nov. 13, 1896, 239.

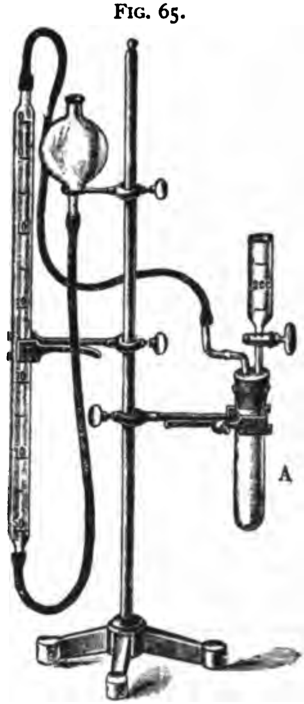
Starch—Products of Hydrolysis by Acids and Diastase.—Recent investigations of Lintner and Drill lead them to the conclusion that the following compounds result from the hydrolysis of starch: With oxalic acid—erythrodextrin I, erythrodextrin IIa, erythrodextrin IIb, achroodextrin I, achroodextrin II, isomaltose, dextrose. With diastase—amylodextrin, erythrodextrin I, achroodextrin I, achroodextrin II, isomaltose, maltose. Others, among them Brown and Morris, deny the existence of isomaltose and mention another compound, malto-dextrin, an intermediate between dextrin and maltose. They had, in 1885, discovered the remarkable law that at any stage of the conversion of starch, by diastase, the total product in its optical properties and relation to Fehling's solution, behaved exactly as if made up of two compounds only, maltose and dextrin, so that it was possible by taking the rotary power to calculate at once the cupric reducing power if the total carbohydrates were known. This law indicated that however complicated the bodies isolated, they could be considered as existing in solution as two simple compounds, and did much to establish the validity of the principle of the usual commercial analysis of worts and similar products.

More recently Rolfe and Defrew have made investigations, first, to determine whether there was any simple constant relation between the optical rotation and the cupric reducing powers of starch products hydrolyzed under different conditions; and secondly, whether any laws could be found affecting the three simple bodies assumed to be formed and determined by the usual methods of analysis. The results point out the fact that the cupric reducing power of the total product bears a constant relation to the specific rotatory power, even when the starch is hydrolyzed under widely varying conditions; as per example, when using different acids, different amounts of starch, or when varying the temperature, pressure, and time of action. From their results as a whole, the evidence is strong: (1) That in any homogeneous acid-converted starch product, irrespective of the hydrolysis, the specific rotatory power always represents the same chemical composition. (2) That but three simple carbohydrates, possibly in molecular aggregation, exist in the solution of a starch product

hydrolyzed by acids.—Pharm. Rev., June, 1897, 117; from Techn. Quart., *10*, 133.

Grape Sugar—Indirect Method of Estimation in Urine by Means of Fehling's Solution.—Riegler recommends a method for the estimation of grape sugar in urine, which is based upon the fact that Fehling's solution is reduced with the same facility by phenylhydrazin, with the difference that nitrogen is evolved by the latter reaction. On adding a measured quantity of Fehling's solution to the solution of grape sugar, the excess of the quantity added is determined by the greater or less amount of nitrogen evolved on the addition of phenylhydrazin solution. The author has constructed an apparatus for this purpose, which is shown in the accompanying cut (Fig. 65), and which is supplied by a German maker in two forms, one in which the number read off from the graduated tube shows the amount of nitrogen, the other giving the direct reading of the sugar percentage. The Fehling's solution used is essentially that of the U. S. P. The phenylhydrazin solution is made by dissolving 5 Gm. of C. P. crystallized phenylhydrazin hydrochlorate in 50 Cc. of water, by the aid of heat, and filtering, if necessary. Into the test-tube *A*, place 1 Cc. of urine, if not above sp. gr. 1.030, in which event 1 Cc. of a mixture of equal volumes of the urine and water. Then add 5 Cc. each of the cupric sulphate and alkaline Rochelle salt solution (= 10 Cc. Fehling's solution). Agitate the mixture, and heat it over a spirit lamp to boiling. Now put the tube into the clasp of the stand, insert the rubber stopper carrying a stoppered funnel-tube and bent connecting-tube, open the glass stopper in the funnel-tube, and, after connecting with the rubber tube as shown in the cut, insert the test-tube in a beaker of cool water. After fifteen minutes, the glass-level bulb is raised until the water, previously placed into this portion of the apparatus, and acidulated with hydrochloric acid, stands at zero in the graduated burette, and fix it at this point on the stand. Then close the stop-cock, raise the test-tube out of the water, fasten it to the stand, and pour into the funnel-tube sufficient phenylhydrazin solution to fill it to the upper mark. Now open the stop-cock, allow the solution to flow into the test-tube until the level in the funnel-tube falls to the lower mark, and then again close the stop-cock. Shake the contents of the test-tube for five minutes, allow it

FIG. 65.



to remain at rest for five minutes in the holder, again shake for one minute, replace, and read off the amount of nitrogen that has passed into the graduated burette. The amount of nitrogen so ascertained, after correction for barometric pressure, corresponds to the amount of phenylhydrazin consumed to reduce the excess of Fehling's solution, and gives data upon which the amount of grape sugar in the sample is easily calculated.—Amer. Drugg., April 26, 1897, 228.

Referring to the foregoing, Henry C. C. Maisch calls attention to the liability to error which is inherent to all methods for the determination of sugar in urine that are dependent on the use of copper salts, and particularly of Fehling's solution. In a solution as complex as urine there are a number of compounds present, or likely to be present, such as uric acid, creatinin, allantoin, nucleo-albumin, lactic acid and biliary coloring matter, which have more or less of a reducing action on Fehling's solution. While, it is true, these compounds are usually present in small quantities, their presence becomes of special importance when the percentage of sugar is small. It is, therefore, not safe to rely solely on Fehling's test when making examination for sugar in urine, but to call to aid, as is the author's practice, the principal chemical tests for its determination, one of the most useful and reliable being that of Rübner, and its modification by Penzoldt. Rübner uses 3 Gm. lead acetate to 10 Cc. urine, filters, adds ammonia water until a permanent precipitate is formed and then warms to about 80° C. The presence of sugar is indicated by the precipitate becoming pinkish or red, depending on the percentage. Penzoldt's modification simply consists in the substitution of the basic for the neutral lead acetate. In these cases, however, as in Fehling's, the question will arise whether or not other compounds besides sugar will give the same reaction. —Amer. Jour. Pharm., June 1897, 294–296.

Arabinose—Action of Dilute Acids.—Berthelot and André conclude from their experiments, that under the influence of dilute acids, arabinose gives rise to three orders of simultaneous reactions, viz., the formation of *furfurol* by distillation, which differentiates the pentoses from the glucoses properly so-called; the formation of *humic acid*, especially in closed vessels; and the slow formation of *carbonic acid*, especially marked on slow distillation.—Chem. News, Nov. 13, 1896, 246; from Compt. rend., Oct. 26, 1896.

Inosite—Presence in the Thyroid Gland, and Preparation.—During the process of making thyraden, a considerable amount of a substance can be obtained, according to R. Tambach, in the form of handsome, nacreous needles, partly grouped in the form of rosettes. The chemical and physical properties of these needles are identical with those of inosite (meat-sugar), a well-known constituent of many animal organs—the muscles, the heart, lungs, kidneys, liver, spleen, and brains of the ox; but its presence in the thyroid gland was heretofore not known, at least not mentioned. Physio-

logical experiments with inosite have not as yet been carried to a conclusion, but the unusually large amount of the substance present in the thyroid glands, as compared with the amount present in other organs, suggests the question whether the medicinal virtues of the glands are not directly proportional to the amount of inosite present in them. It has been shown that inosite is present to the extent of 0.04 per cent. in brains, 0.076 per cent. in kidneys, and even less in the spleen, lungs, and liver; whereas from 0.5 to 0.8 per cent. is usually found in the thyroid gland, the maximum being 1 per cent.

Inosite obtained from thyroid glands is equally as soluble in water, alcohol, and ether, as that described by Scherer, and also gives similar characteristic reactions with nitric acid, ammonia, and calcium chloride. It is precipitated in a gelatinous form by neutral plumbic acetate after some time, and does not reduce Fehling's solution, but reduces an alkaline silver-solution when heated with it. The melting-point of inosite, according to Vohl, lies between 150° and 160° C.; according to Scherer, at 210° C.; according to Marquenne, at 217° C.; while according to Fick it is at 225° C. Tambach's experiments in this direction, carried on with different samples of inosite crystallized out from alcohol, water, and ether, respectively, and purified, demonstrated that it loses two molecules of water of crystallization at 110° C., "cakes" at 210° C., and melts without decomposition at 217° C. Clinical data are not as yet to hand.—Merck's Rep., July 1, 1896, 332.

Vegetable Acids—Color Reaction with β-naphthol Sulphuric Acid, which see.

Acetic Acid—Value as a Menstruum and Solvent.—Some years ago Dr. Edward R. Squibb employed acetic acid successfully as a solvent for certain drugs, and claimed superiority over alcohol in certain cases. (See Proc. 1893, p. 418.) Since then others have experimented in the same direction, and now J. P. Remington records the results of some very comprehensive experiments made with the view to establish the utility and value of acetic acid as a general menstruum and solvent for drugs. Selecting nux vomica as being one of the most difficult and unmanageable drugs to exhaust, he prepared an acetic extract with a 10 per cent. acetic acid. The product, which was dry and pulverulent, contained 15 per cent. of alkaloid, and serves as the type in the author's paper for a new class of galenicals, which he proposes to distinguish from ordinary extracts by the new name

Acetracts.—A series of forty-one experiments made with this "acetract nux vomica" and with extracts of nux vomica are recorded, and they indicate to the authors' satisfaction that acetic acid may be used with advantage for the exhaustion of nux vomica as well as other drugs. Among the drugs experimented with are sanguinaria, kola, squill, ipecac, cinchona, and col-

chicum seed. The present experiments seem to prove conclusively that a solid preparation can be made from nux vomica by means of acetic acid, which, having been assayed and standardized, may be converted into liquid preparations of desired strength by solution in various mixtures of alcohol and water, with or without glycerin, and of different strengths of acetic acid.

Fluid Extracts with Acetic Acid as Menstruum were also made four years ago, and, while the author is not ready to report on these definitely, they have stood the test of time very favorably with the same preparations made with alcohol. Notably among these is a fluid extract of sanguinaria made with acetic acid of 60 per cent. This, after four years, does not show the least sign of precipitation.—Amer. Jour. Pharm., March, 1897, 121–126.

White Wine Vinegar—Composition of the Real Article.—Alfred H. Allen, in a paper read before the Br. Pharm. Conference, deprecates the practice, which has almost become a prescriptive right, of dispensing dilute acetic acid when "white wine vinegar" is called for. He has subjected two samples of the true article to analysis and found them to contain: acetic acid, 6.37 and 6.49 per cent; extractive matters, 1.42 and 1.55 per cent.; the latter containing mineral matters corresponding to 0.28 and 0.30 per cent. with alkali (K_2O), corresponding to 0.046 and 0.046 per cent. of the original vinegar. Two other samples, obtained direct from the importer and believed to be genuine white wine vinegar, gave closely concordant results with each other and did not differ very greatly from the samples first examined, except that they were somewhat stronger. The genuine article always contains a notable quantity of acid potassium tartrate; it has the color of sherry, a vinous aroma, and a peculiar flavor.—Yearbook of Pharm., 1896, 321–323.

Acetone—Improved Process.—Dr. Edward R. Squibb has made some improvements on the method of J. Robineau and G. Rollin for the determination of acetone in its admixtures (see Proceedings 1893, 901), which method depends upon the estimation of acetone as iodoform in the cold, the reaction being brought about by the acid of sodium hypochlorite. The solutions and reagents required for the improved process are the following, Dr. Squibb giving explicit directions for their preparation:

1. *Standard Solution of Acetone*, containing in each 10 Cc. of distilled water, 0.1 gram of pure acetone prepared by the bisulphite process.

2. *Solution of Potassium Iodide*, in distilled water, containing 2.5 grams of potassium iodide in each 10 Cc.

3. *Solution of Sodium Hydroxide*, prepared by dissolving 257 grams of commercial caustic soda, purified by alcohol, in sufficient water to make 1 liter, and setting aside to clear.

4. *Solution of Iodide and Soda*, made by mixing 1000 Cc. of the potas-

sium iodide solution (No. 2) with 850 Cc. of the sodium hydroxide solution (No. 3), the latter being carefully decanted from any sediment.

5. *Bicarbonated Starch Solution*, made by mixing 0.125 gram of starch with 5 Cc. of cold water, adding this to boiling water, boiling it, allowing it to become cool, and adding 2 grams of sodium bicarbonate.

6. *Solution of Sodium Hypochlorite*, made by adding to a liter of the official solution of chlorinated soda (Liquor Sodæ Chloratæ, U. S. P.), containing 2.6 per cent. of available chlorine, 25 Cc. of the clear solution of sodium hydroxide (No. 3). The titre of this solution—*i. e.*, its relation to the standard acetone solution (No. 1)—must be established from time to time, and it is of service so long as 0.1 gram of the acetone (10 Cc. of the standard solution) does not require more than 20 Cc. of this solution. To preserve such a solution from change when there is much of this titration to do, Dr. Squibb has fitted to the containing bottle an *automatic zero burette*, which is shown by Fig. 66, which possesses the further advantage that it is convenient for rapid working, and is easily constructed from the resources of any laboratory.

FIG. 66.

Automatic Zero Burette.

The Titration is carried out as follows: The burette being filled with solution of sodium hypochlorite (No. 6), 10 Cc. of the standard solution of acetone (No.

1) is measured into a beaker of 50 Cc. capacity, and 20 Cc. of the solution of iodide and soda (No. 4) is added and stirred well. Into this the hypochlorite solution is passed in rapid dropping, with constant stirring until 8 or 10 Cc. has been run in. Then the precipitated iodoform is allowed to settle out, and a drop or two of hypochlorite is added. Should this produce dense cloudiness, 0.5 Cc. more of hypochlorite is added, and so on until the cloudiness is very slight. Then testing with the bicarbonated starch solution (No. 5) begins. A drop of the liquid is transferred by a rod to a white porcelain surface, and a similar drop of the starch solution is placed very near it. Then with the first rod the drops are made to connect by a fine line, so that the whole has a dumb-bell form. If there is no blue line seen at the moment of contact, more hypochlorite solution is added, 0.1 to 0.2 Cc. at a time, until such line appears. The process is ended, and according to the faintness or intensity of this blue line the last addition is deducted or added to the amount of hypochlorite consumed in the conversion of the acetone into iodoform. Supposing, then, that in the foregoing experiment 10.5 Cc. of solution of hypochlorite has been consumed, this quantity would be equivalent to 0.1 Gm. of acetone, and so calculated in making a test or determination of acetone in a solution of unknown strength, viz., as 10.5 : 1 : : a : x.

In the application of this test it is necessary to preliminarily judge approximately, by taste or smell, its strength. If these would indicate about 25 per cent. or below, then 0.4 Cc. is taken for the test; if judged to be nearly absolute, then only 0.1 Cc. is to be taken. The various steps are then the same as those above given in detail. The presence of ethyl alcohol does not interfere with the reaction, since this is incapable of producing iodoform in the cold. Experiments are recorded, which fully confirm this observation of Messrs. Robineau and Rollin.—Ephemeris, Jan. 1897, 1766.

Acetone—Volumetric Estimation.—Lyman F. Kebler observes that with the increasing demand for acetone it can reasonably be expected that the manufacture of this product will be materially cheapened in due time, and that with their cheapening, samples of various degrees of purity will be met with. He has therefore endeavored to devise a method for the volumetric estimation of absolute acetone that shall be sufficiently reliable, and at the same time free from the objections he points out in the original method of J. Messinger and in the modification of the same suggested by Dr. E. R. Squibb. The objections to these methods are: first, the necessity for *pure acetone*, and second, the tedious drop-end reaction, which consumes much time. The author has now adapted Dr. Squibb's modification so that both these objections are eliminated, using the following solutions:

1. A 6 per cent. solution of hydrochloric acid.

2. The alkaline solution of potassium iodide suggested by Dr. Squibb, and prepared as follows: Dissolve 250 Gms. pure potassium iodide in distilled water and make up to one liter. Dissolve 257 Gms. sodium hydroxide, purified by alcohol, in distilled water and make up to 1 liter. Allow the insoluble part to subside and mix 850 Cc. of the clear solution with the liter of solution of potassium iodide.

3. A decinormal solution of sodium thiosulphate.

4. A sodium hypochlorite solution, about $\frac{4}{5}$ normal, or containing from $2\frac{8}{10}$ to 3 per cent. of available chlorine: Mix 100 Gms. bleaching powder (35 per cent. available chlorine) with 400 Cc. of water, add a solution of 120 Gms. crystallized sodium carbonate in 400 Cc. hot distilled water to the mixture, allow to cool in a covered vessel, decant the clear liquid, filter the remainder, and pass enough water through the filter to make 1 liter clear liquid; then add 25 Cc. of sodium hydroxide solution, sp. gr. 1.29, to the liter of liquid.

To estimate the acetone it is diluted with water so as to produce a 1 to 2 per cent. solution, as recommended by Messinger. Place 20 Cc. of the alkaline potassium iodide solution in a flask with 10 Cc. of the acetone solution; mix well, and run in from a burette, while rotating the flask, an excess of the sodium hypochlorite solution, insert the stopple quickly and shake well for one minute. Then render the mixture acid with the hydrochloric acid solution, add, while rotating the flask, an excess of sodium thiosulphate solution, and allow the mixture to stand a few minutes. Then add the starch indicator and re-titrate the excess of sodium thiosulphate. The relation of the sodium hypochlorite solution to the sodium thiosulphate solution being known, the percentage of acetone can readily be calculated.

The method depends, as is well known, upon the formation of iodoform from the acetone at the ordinary temperatures, and is consequently not interfered with by ethyl alcohol or other impurities requiring endothermic reaction.—Am. Journ. Pharm., Feb. 1897, 65–73.

Alkali Benzoates—Method of Estimation.—G. Rebriers recommends the following method for estimating the benzoates of the alkalies. The base is estimated by adding to the substance hydrochloric acid in excess, heating on the water-bath until all free acid is removed, and titrating the residual chloride by means of $\frac{N}{10}$ silver nitrate solution. The benzoic acid is determined in a second and equal portion, which is dissolved in water (50–60 Cc.), and sulphuric acid ($\frac{N}{10}$) added, in the exact quantity needed to combine with the metal; the liberated benzoic acid is then titrated with $\frac{N}{10}$ soda, phenolphthaleïn being used as indicator. With normal benzoates, the quantity of soda required is equal to that of the sulphuric acid employed, whilst with basic and acid salts, it is less and more respectively. After proving the accuracy of this method, the author investigated the composition of various benzoates employed in pharmacy. He finds that

Sodium Benzoate crystallizes with 1 mol. H_2O, and is usually tolerably pure.

Potassium Benzoate contains 3 mol. H_2O, and generally has an acid reaction.

Lithium Benzoate contains 1 mol. H_2O, and its analysis requires care to avoid the loss of lithium chloride.

Ammonium Benzoate is anhydrous. The ammonia is estimated in this by boiling with excess of soda solution, and titrating with sulphuric acid. —Pharm. Rev., Aug. 1896, 186; from Jour. de. Pharm., (6) *3*, (1896) 113.

Metallic Benzoates—Variability as Found in Commerce.—Rebiére has examined the benzoates of mercury and of bismuth of commerce, and finds these compounds as supplied to be far from satisfactory. He has prepared satisfactory salts and gives the processes as follows:

Mercury Benzoate.—This salt requires 45.25 per cent. Hg and 54.75 per cent. of acid. A known quantity of pure mercuric chloride is precipitated with soda and washed until free from chloride. From the amount of mercuric chloride taken the amount of oxide is calculated and sufficient finely powdered benzoic acid mixed with it to leave a slight excess of HgO. The mixture, diluted with a little water, is left for twenty-four hours, and then heated to boiling; a white amorphous powder results, which, when again heated with a large volume of boiling water, redissolves, and on cooling crystallizes out in long silky needles, which are drained and dried at the ordinary temperatures. These crystals have the definite composition $Hg(C_7H_5O_2)_2$, are true mercuric benzoate, and not an oxy salt.

Bismuth Benzoate.—Freshly precipitated oxide of bismuth thoroughly washed, is drained to a pasty consistence. The amount of anhydrous Bi_2O_3 is determined in a portion of the paste, and to the rest is added the theoretical quantity of finely-powdered benzoic acid to produce the salt $BiO(C_7H_5O_2)$, which contains 60.25 per cent. of bismuth and 35.12 per cent. of benzoic acid. The mixture is diluted with sufficient water to make it fluid, well mixed, and left in contact for twenty-four hours. The precipitate is then thrown on a cloth, drained, and dried in the air.—Pharm. Journ., Jan. 30, 1897, 82; from Bull. de la Soc. de Pharm. de Bord., xxxvi., 272 and 280.

Benzacetin—Value in Neuralgias.—In the Lunatic Asylum of Stephansfeld, benzacetin has been tried in the treatment of various neuralgias, with generally satisfactory results, the remedy being given in combination with caffeine in the following proportions: Benzacetin, 85.8 parts; caffeine, 8.5 parts; citric acid, 5.7 parts. The dose of this mixture was 1 to 2 Gms., repeated in one hour if no relief was obtained. The pain was generally eased within from half to three hours, and did not recur for several days. The remedy does not appear to have any direct hypnotic effect.—Therap. Monatsh., 1896, 319.

Benzoyltriaceton and Benzoylbenzaldiacetonalkamin—New Local Anæsthetics.—These two compounds have recently been patented in Berlin. The benzoyltriaceton melts at 97°, the other at 94°. The new compounds form neutral salts with organic and inorganic acids, and are said to possess anæsthetic properties.—Ztschr. Oest. Apoth. Ver., Jan. 20, 1897, 53.

Benzoiodhydrin—A Substitute for Potassium Iodide.—Chenal suggests benzoiodhydrin as a useful substitute for potassium iodide. It is prepared by shaking a mixture of benzoyl iodide and epichlorhydrin, at a heat not exceeding 158° F.; the resulting brown, fatty mass, benzochlorhydroiodohydrin, is soluble in ether, alcohol, and petroleum oils, but not in glycerin. Administered in doses of 0.13 Gm. (corresponding to 1 Gm. of KI), he found that it caused no disagreeable symptoms of iodism; and from twelve observations he concludes that its immediate therapeutic effects are equal to those of the potassium salt, while it is more slowly eliminated, and a smaller dose is required. He attaches much weight to the antiseptic action of the considerable proportion of benzoic acid and chlorine contained in the drug, but admits that the question as to the permanence of the results requires more prolonged observation.—Merck's Rep., April 1, 1897, 212; from Brit. Med. Jour., Nov., 1887, 32.

Saccharin—Pharmaceutic and Technical Uses.—R. H. Gorden calls attention to the constantly increasing use of saccharin, and gives a good description of its characters. It is employed extensively by bottlers and manufacturers of ciders, soda water, ginger ale, and kindred products; by meat-packers, brewers, distillers and bakers, and by the manufacturers of tobacco to replace sugar and licorice to great advantage. He suggests that it may be used as a practical substitute for sugar in soda water syrups, as follows: Heat in an earthenware or enameled vessel one gallon of water to boiling, then stir in one ounce of saccharin, and when this is dissolved, add a solution of 32 pounds of sugar in seven gallons of water. This will make a total quantity of 9 gallons and 2.4 pints of syrup. Flavoring and acid can be added in the usual way, except that from 15 to 20 per cent. less will be required, and a finer flavored, less cloying syrup will be obtained than when it is made with sugar alone. Moreover, at present prices, there will be a saving approximating to 2 cents per pound of sugar usually employed to make the quantity of syrup mentioned in the formula. It is important that no metallic utensil should be used for making syrup or other preparations with saccharin, though tin-plates will answer provided the iron is not exposed.—Proc. Tenn. State Drugg. Assoc., 1896, 28–30.

Sodium Salicylate—Formation of a Crystalline Hydrate.—It is stated by Romyn, that when sodium salicylate is dissolved in its own weight of water, after a lapse of time it deposits large prismatic crystals showing double refraction and containing six molecules of water. If crystallization

does not readily set in, it may be started by introducing a crystal from a previous experiment. The crystals rapidly effloresce, and water is quickly expelled on drying at 8°.—Pharm. Journ., October 10, 1896, 314; from Med. Tydschr. Pharm.

Salacetol—Solubility.—It is stated in "Pharm. Centralh." (1897, 165) that salacetol contains 71.1 per cent. of salicylic acid, and is soluble in the various solvents as follows: In ether, 1 : 6; acetic ether, 1 : 2.5; alcohol, 1 : 12; chloroform, 1 : 2; castor oil, 1 : 16; cod-liver and sesame oils, 1 : 17; almond and olive oils, 1 : 20, and oil turpentine, 1 : 25. Its fair solubility in castor oil makes its administration in this vehicle very desirable. —Merck's Rep., April 15, 1897, 244.

Cordol, Cordyl and Cordeine—Three New Hypnotics.—Dr. Josef Rosenberg calls attention to three new hypnotics which have been named respectively, "cordol," "cordyl," and "cordeine." He has made clinical observations with cordol and cordyl, but not with cordeine, and finds them to be efficient hypnotics, which can be given in doses of from 0.5 to 1.5 Gm. three or four times daily, and, being tasteless and easily borne on the stomach, are willingly taken.

Cordol is, chemically, "tribromsalol," and contains 53.21 per cent. of bromine. It is insoluble in water, very difficultly so in alcohol and in ether, more easily in glacial acetic acid, acetone, and in chloroform, and very easily in xylene and in benzene. It crystallizes from hot glacial acetic acid in long, slender, white needles; obtained from chloroform the needles are somewhat shorter. They melt at 195° C.

Cordyl is, chemically, "acetyl-tribromsalol," and contains 48.68 per cent. of bromine. It is also insoluble in water. The crystals obtained from alcohol are in the form of fine, white needles that melt at 108.5° C.

Cordeine is, chemically, "methyl-tribromsalol," and contains 51.61 per cent. of bromine. Like the other two compounds it is insoluble in water, but very easily so in chloroform, and somewhat more difficultly so in 90 per cent. alcohol, from which it crystallizes in the form of fine, white needles, melting between 126 and 127° C.

All these substances are easily saponifiable by even very dilute solutions of caustic alkalies.—Merck's Rep., May 1, 1897, 280; from Der Frauenarzt, 1897.

Citric Acid.—Formation by the influence of *Moulds*, which see under "Materia Medica."

Citric Acid—Synthesis.—Trevor Laurence has accomplished the synthesis of citric acid by the condensation of ethylic oxalylacetate with ethylic bromacetate in the presence of zinc. The mass, after treatment with dilute sulphuric acid, was extracted with ether, which removed the ethylcitrate formed together with other esters. From the ethyl citrate, purified from other esters by fractional distillation, the citric acid was obtained by

saponification with alcoholic potash, precipitation as the calcium salt, and decomposition of this in the usual manner.—Journ. Chem. Soc., lxxi., 459.

Tartaric Acid—Manufacture.—V. Holbing gives an interesting description of the manufacture of tartaric acid from the argol and lees of wine. The lees are used for the manufacture of tartaric acid, either in the moist condition or after being dried. The moist, pasty lees are removed from the tuns into sacks, and pressed. They then contain varying amounts of acid potassium tartrate and calcium tartrate, with some alcohol and higher esters. They are mixed with water and distilled, the distillate yielding the so-called lager brandy and wine oil or Cognac oil. The residue, which is used for the manufacture of tartaric acid, contains from 1 to 8 per cent of that acid. Lees containing a higher percentage of tartaric acid, which only occurs after the first stage of the fermentation, are well pressed and dried, usually by the heat of the sun, and sold as dried wine lees. To obtain the tartaric acid from the crude materials (argol and wine lees), the only method suitable for technical purposes is the precipitation of the acid potassium tartrate as calcium tartrate, and subsequent preparation of the tartaric acid from the latter. The methods of obtaining the calcium tartrate vary according to the nature of the crude material. These as carried out modernly, are fully described in Pharm. Era, Nov. 26, 1896, 692; from Jour. Soc. Chem. Ind.

Cream of Tartar—Analysis of Commercial Samples.—George F. Payne has subjected eleven commercial samples of cream of tartar to analysis, with results which are given in detail, but are briefly as follows: Ten samples were obtained from grocery stores in various portions of the State of Georgia, and one sample from a drug store. Out of the ten samples purchased from grocery stores, five samples contained absolutely no cream of tartar whatever; two contained less than 57 per cent., one less than 80 per cent., and two only were samples of first-class cream of tartar. This so-called cream of tartar is frequently sold by the jobber in handsome, ornamented tins at the rate of 20 cents a pound, and retailed by the grocer at 40 cents a pound; when we consider that it is chiefly made up of dried alum and acid calcium phosphate, there seems to be an enormous profit for some one. In the samples examined, however, he found that there is not only a substitution of dried alum and acid calcium phosphate for the cream of tartar, but that the substitutes themselves are in some cases adulterated to the extent of 75 per cent. with terra alba and starch.—Drug. Circ., July, 1896, 157, 158.

Aconitic Acid—Identification in the Root of Aconitum heterophyllum.—Hooper A. D. Jowett, in connection with his studies and experiments upon *Atisine* (which see under "Organic Bases"), has isolated the acid with which it is associated in the root of *Aconitum heterophyllum*, and examined its properties. It is a white, crystalline substance, obtained by decompos-

ing its lead salt with hydrogen sulphide, and purifying by crystallization from water until its melting point was constant, which, when the acid is dried at 100°, is at 191.5°, when it decomposes with effervescence. This and its composition—which agrees with the formula $C_6H_6O_6$—identifies it with aconitic acid.—Journ. Chem. Soc., Nov. 1896, 1521.

Quinic Acid—Preparation.—According to Dr. de Vrij quinic acid may be prepared as follows: The finely powdered cinchona bark is extracted with distilled water by maceration and percolation, air being excluded as much as possible. The slightly colored liquid is evaporated in vacuum to a thin syrup. To this 95 per cent. alcohol is added under continuous stirring as long as a precipitate is produced. The white calcium cinchotannate colored more or less by cinchona red thus obtained is kneaded with alcohol and then dissolved in water. A slight excess of calcium hydroxide is added and the mixture boiled and evaporated to dryness. The cinchotannic acid is thereby converted into cinchona red. The resulting calcium quinate is extracted with water and purified by crystallization. The free acid is obtained by precipitating the calcium from the solution as oxalate. Succirubra bark yielded on an average 10–11 per cent. of crude calcium cinchotannate, whereas American bark yielded much less.—Pharm. Rev., Aug., 1896, 187; from Nederl. Tijdsch. voor Pharm. Chem. en Tox., 1896.

Pilocarpic and Pilocarpidic Acid—Preparation from the Alkaloids and Characters.—In connection with their researches on the jaborandi alkaloids, Petit and Polonovski have investigated pilocarpic and pilocarpidic acids. They find that so far from these acids being hypothetical, they have succeeded in isolating both in the free state, and that they are fairly stable, particularly so in the presence of water. These acids are formed from the bases, pilocarpine and pilocarpidine, which are regarded as their anhydrides; when these are treated with sodium, they undergo hydrolysis, and the sodium salts of the acids are formed. From the sodium salt, the barium salt was prepared, and this, when decomposed with an equivalent of sulphuric acid, liberates the organic acid. On evaporation of their solutions they are obtained as amorphous varnish-like residues, which are very soluble in water, but insoluble in ether and chloroform, and show a markedly lower rotation than the original alkaloids. On heating, partial rehydration takes place, with partial regeneration of the original alkaloid, and this regeneration takes place completely on the addition of a dilute acid. Indeed, in very dilute acid solutions the dehydration of the acid may be observed by the progressively increasing optical activity of the solution, until ultimately it reaches the figure of the pure alkaloid. (See *Pilocarpine* and *Pilocarpidine* under "Organic Bases.")—Pharm. Journ., May 29, 1897, 466; from Journ. de Pharm., (6) v., 481.

Gelsemic Acid—Preliminary Evidence of Distinction from Aesculin.—

Having come into possession of about 50 Gms. of an unusually fine crystalline sample of gelsemic acid, of undoubted purity, through the kindness of Professor Lloyd, Virgil Coblentz has undertaken the task of determining its ultimate composition with a view to confirming or disproving the claims of Dr. Chas. Robbins (see Proceedings 1877, 135), that it is identical with æsculin. This assumption has already been contradicted by Professor Wormley, and inasmuch as Dr. Robbins carried on his combustions in a simple bayonet tube with copper oxide, as was customary at that time, Prof. Coblentz also questions the value of the analyses and formulas deduced therefrom, even though the figures correspond within reasonably close limits. For gelsemic acid is one of the few organic substances which, upon heating with copper oxide or any oxidizing agent, gives up only a portion of its carbon as carbon dioxide, the rest separating as a graphite-like deposit on the sides of the combustion tube, which cannot be removed even at the highest possible temperature—some twenty combustions made after various methods supporting this statement. Several analyses were also attempted with no better success by the well-known method of wet combustion—which, as carried out by the author, is described in detail and illustrated by a cut. The analysis of the acetyl and bromo derivatives of gelsemic acid by this method gave very close concordant results, but no reliable data could be obtained from the mother substance, owing to the fact that a small portion of the carbon escapes combustion. However, from various data obtained in the course of his investigations, the author hopes, at a near future date, to be able to shed some light on the constitution of this interesting substance, as well as to prove his surmise that gelsemic acid is a principle distinct from æsculin. This surmise receives further support in the difference of the melting points of æsculin and gelsemic acid, and of their acetyl and bromo derivatives, which show an extremely wide range.—Amer. Journ. Pharm., May, 1897, 228–231.

Picric Acid—A New Reaction.—The usual tests for picric acid are more or less circumstantial, and consume time. A. Swoboda calls attention to a new and simple reaction, which depends upon the formation of a flocculent violet-colored precipitate, when a cold aqueous solution of picric acid is mixed with a similar one of methylene blue. This precipitate is soluble in ether and chloroform, forming a blue solution. If the chloroform solution is evaporated spontaneously, in a porcelain vessel, it leaves a characteristic violet-colored residue—in all probability a picrate. The reaction may be applied to objects that are colored with picric acid, such as toys, etc. If, for instance, the object is coated with a yellow varnish containing picric acid, it suffices to drop a little alcohol upon the surface, followed by solution of methylene blue. A violet precipitate is produced, and this dissolves with a blue color upon the application of a few drops of chloroform, upon the evaporation of which a violet coating remains. Inversely the

reaction may serve for the determination of methylene blue.—Zeitschr Oest. Apoth. Ver., Aug. 20, 1896, 617–618.

Picric Acid—Poisonous Characters.—Dr. Th. Bokorny observes that free picric acid is a powerful poison for *algæ*, a 0.5 per cent. solution killing them in fifteen minutes, while even dilutions to 0.1 and 0.05 per cent. kill them within twenty-four hours. The *fungi*, on the other hand, are not so sensitive to its influence, and require a solution of at least 0.1 per cent. Of the picrates, the ammonia salt is more powerful in its effects upon low organisms than potassium picrate.—Chem. News, Jan. 29, 1897, 50; from Chem. Ztg.

Tannin—Methods of Determination in Tanning Materials.—In a paper read before the N. Y. Section of the American Chemical Society (Jan. 9, 1897,) John H. Yocum reviewed the methods of estimating tannin in general use, showing thorough familiarity with both the theoretical and the practical aspects of the subject. His conclusion was that the hide powder method, as laid down by the Society of Official Agricultural Chemists, was decidedly the most practical and useful method to be followed, and would yield satisfactory results provided due care was exercised to obtain hide powder of uniform character. In the discussion which ensued, the fact was brought out that it was practicably impossible to obtain complete exhaustion of tannin by means of lukewarm water. It was also brought out that the mere absence of color in the percolate by no means proved that the bark had been completely exhausted.

Acorn Tannin.—Percentage in *acorns*, which see under "Materia Medica."

Bismuth Subgallate and Bismuth Subtannate—Characters of Distinction.—In a previous paper (see Proceedings 1896, 797) Ferd. A. Sieker had called attention to a simple method of distinguishing between the subgallate and the subtannate of bismuth, in which he stated that the subtannate is but very slowly soluble in a *50 per cent.* solution of sodium hydroxid, whereas the subgallate dissolves almost instantaneously. The strength of solution given is an error; it should have been a *5 per cent.* solution, *i. e.*, Liquor Sodæ, U. S. P. The behavior of these two salts toward a ten (10) per cent. solution of crystallized sodium carbonate is also interesting. The subgallate dissolves slowly in the cold, readily on application of heat. The subtannate is insoluble even on prolonged boiling, but is decomposed. While the subgallate retains its canary yellow color and appearance indefinitely, the subtannate, though of a beautiful yellow at first, assumes a dirty yellow color on keeping.—Pharm. Rev., June, 1897, 112.

ORGANIC BASES.

Organic Bases—Application of Potassium-Bismuth-Iodide for their Isolation.—E. Jahns observes that for the isolation of such bases as muscarine,

choline, vetaine, trigonelline, stachydrine, etc., which, on account of their ready solubility in water and insolubility in liquids that are used to shake organic bases out of such solution, cannot be prepared in the ordinary way, potassium-mercuric iodide and phosphomolybdic acid have heretofore been used and recommended, whereas potassium-bismuth-iodide has been almost completely ignored. This is probably due to the opinion expressed by Dragendorff, who introduced this very sensitive alkaloidal reagent, that the precipitates produced by it possess little stability. Nevertheless, the author finds that it is not alone applicable for this purpose, but even superior to the other reagents named. He uses for this purpose the reagent of Dragendorff as improved by Kraut, which is prepared as follows: 80 Gm. subnitrate of bismuth are dissolved in 200 Gm. nitric acid, sp. gr. 1.18 (30 per cent.), and the solution is poured into a concentrated aqueous solution of 252 Gm. of potassium iodide. The potassium nitrate formed is allowed to crystallize out, and the solution is then diluted with water to 1 liter. While containing the same amount of bismuth iodide, it contains only half as much potassium iodide as the reagent prepared by Dragendorff's formula, a condition of considerable influence to the sensitiveness of its reaction upon organic bases. While this reagent may be used directly upon the vegetable solutions containing an alkaloid, after acidulation with dilute sulphuric acid, it is preferable to treat such solution preliminarily with basic lead acetate with the view to the removal of coloring matter, albuminoids, etc., and removing the excess of lead by sodium phosphate. The solution is then concentrated by evaporation, a considerable quantity of diluted sulphuric acid is added, and Kraut's reagent is then added in excess. The red precipitate is thoroughly washed, and while still moist, triturated with as much silver carbonate as is necessary to remove the red color from the mixture, and the filtrate no longer gives a reaction for iodine. The filtrate now contains the pure base, or its carbonate, from which traces of silver may be removed by means of hydrogen sulphide. By the aid of this method the author has determined the presence of

FIG. 67.

Choline in the following plants in which heretofore it has not been found: Flor. chamomil. vulg.; Herb. Millefolii; Herb. Meliloti; Fol. Malvæ; Herb. Cochleariæ; Fruct. Anisi vulgaris; Cort. Sambuci; and Sem. Robiniæ Pseudacaciæ. It is also

contained in Caspella bursa pastoris, being the *bursine*, described by Bombelon, in 1888, in the belief that it was a new alkaloid. Furthermore, it is present in considerable quantities in the seeds of *Lathyrus sativus* and *L. Cicera*, along with somewhat smaller quantities of *betaine*. —Arch. d. Pharm., 235 (March, 1897, 151–156).

Alkaloids—Apparatus to Facilitate Extraction.—Charles Platt suggests the apparatus shown by Fig. 67 to facilitate the separation of emulsions which so frequently form in the extraction of alkaloidal fluids by means of ether or chloroform. The filter tube consists of a tube about 12.5 Cm. long and 14 Mm. in diameter, narrowed down to a tube of 3 Mm. diameter. In the neck of this filter is placed a platinum wire which has been bent at right angles at its tip to prevent the absorbent cotton filter from being drawn through. The tube is filled with ether-washed absorbent cotton to the height of 4 Cm., firmly packed; then the apparatus is connected with a filter pump and the emulsion is poured into the tube. According to the author, the most troublesome emulsions can be separated. —Pharm. Era, April 1, 1897, 392.

Alkaloids—Precautions in Drying.—D. B. Dott, referring to discussions as to the proper temperature and time of exposure to be observed in drying the alkaloids and their salts, when these are being estimated by the pharmacopœial methods, observes that drying in the water-bath is, no doubt, the most convenient course, and should be adopted when not contraindicated. But it must be borne in mind that the "temperature of a water-bath" is not a constant, but varies according to circumstances. The larger the bath the lower the temperature, for the heating surface does not increase in anything like the ratio of the cubic space. A bath which has almost no ventilation will attain a higher temperature than one which is suitably ventilated for the drying of moist precipitates. With only a little water in the bath the temperature will not rise so high as when well filled with boiling water. Wherefore it is evident that a substance which does not readily part with its water a few degrees below 100° C. should not be directed to be dried in the water-bath, but in an air bath or otherwise at a temperature over 100°.—Pharm. Jour., Jan. 9, 1897, 21.

Alkaloids—Precautions in Drying.—Referring to the same subject as Mr. Dott, E. H. Farr and R. Wright remark that the drying of alkaloids by boiling water has hitherto been the only official (B. P.) process, but that it has been shown that in the case of morphine at least the temperature thus obtained is not sufficient to ensure the expulsion of all the water. In the case of the alkaloids of cinchona and the salts of quinine, however, perfect desiccation may be obtained, though this is accomplished by no means so rapidly as when the air bath at a higher temperature is used. In the case of alkaloidal residues and extractive matters, a great deal depends upon the way in which the drying is carried out. If the round-bottomed

dishes in general use are employed, and care be not taken to prevent it, the alkaloidal or extractive matter collects at the bottom of the dish in a dense fused mass, and desiccation under these conditions will take place very slowly. On the other hand, if a dish with a flat bottom be employed, the substance spreads itself out in a thin film over a large surface, and desiccation is rapid, rarely taking more than two hours.

The following results obtained on determination of quinine in citrate of iron and quinine will show admirably the contrast:

	Weight at the end of each hour when dried in the hot water oven.						Weight after being heated 1 hour in the hot air bath at 120° C.
	1 hr.	2 hrs.	3 hrs.	4 hrs.	5 hrs.	6 hrs.	
In flat dish ..	.447	.442	.442				.442
In round dish.	.459	.446	.443	.442	.441	.441	.441

—Pharm. Journ., March 6, 1897, 203.

Alkaloids—A New Reagent.—Adam Jawowroski suggests a solution of sodium vanadate in water acidulated with acetic acid as a new and valuable reagent for alkaloids, the sensitiveness of which is increased by the addition of a copper salt. The reagent is prepared as follows: 0.3 Gm. of sodium vanadate and 0.3 Gm. of crystallized copper sulphate are dissolved separately, each in 10 Cc. of water, the first-named by the aid of heat. The cold solutions are mixed, sufficient concentrated acetic acid—about 7 to 8 drops—is added to redissolve the precipitate of copper vanadate, and the greenish yellow solution is filtered. The author enumerates a large number of alkaloids with which this new reagent affords precipitates, in some cases from very dilute solutions, in others from more concentrated. To apply the test the salts of the alkaloids are simply dissolved in water, whilst the free alkaloids are dissolved by the aid of dilute acetic acid.—Pharm. Rev., Aug., 1896, 185; from Pharm. Ztschr. f. Russl., 35 (1896), 326.

Alkaloids and Glucosides.—Localization in living plants. See *Active Principles of Plants* under "Materia Medica."

Morphine—Stability in Presence of Putrefactive Animal Matter.—J. B. Nagelvoort discusses the recorded observations made by investigators concerning the stability of alkaloids in general, and morphine in particular, under the conditions of putrefactive changes that occur during prolonged exposure of animal matter. His own investigations corroborate the statements made by prominent authorities that the ptomaines formed under

putrefactive decomposition do not give the characteristic reactions by which morphine is recognized; that morphine reactions are obtained after ts prolonged exposure to the influence of animal matter undergoing putrefaction, and that the popular belief in the destructive power for alkaloids, of the decomposition of cadavers, has no foundation in fact.—Amer. Jour. Pharm., July, 1896, 374–379.

Morphine—Reaction with Ferric Salts and Ferricyanide.—Professor E. Schaer finds that morphine reduces ferric chloride as well as potassium ferricyanide, but that in neutral solutions the reducing action is greater upon the ferric chloride than that exercised upon the ferricyanide, while in acid solution the reducing action is greater upon the latter. When morphine reacts upon mixed solutions of the two salts the blue precipitate produced always consists mainly of Prussian blue, with relatively small proportions of Turnbull's blue. A similar reducing action upon ferric chloride and on ferricyanide is exercised by *acetanilid,* but in a less intense degree; but neither morphine nor acetanilid produce a blue precipitate or coloration with ferric acetate—or other forms of soluble ferric oxide—and ferricyanide.—Arch. d. Phar., ccxxxiv., 348.

Morphine.—An antidote to poisoning by *potassium cyanide,* which see under "Inorganic Chemistry."

Morphine—New Condensation Product with Formaldehyde.—A new condensation product obtained by warming an acid morphine solution with formaldehyde, has recently been introduced. Its constitution is similar to that of dicodeylmethane (see under *Codeine*), and it is said to have similar medicinal properties. The new base is amorphous, with difficulty soluble in water, but easily soluble in alkaline solutions, in solution of sodium carbonate, and in alcohol. It melts at above 270° C., and forms an easily soluble (in water) hydrochlorate, which is also soluble in 90 per cent. alcohol, and yields from its aqueous solutions crystalline precipitates with platinic and with mercuric chlorides.—Pharm. Centralh., 1897, 201.

Peronin—A New Morphine Derivative and Narcotic.—Dr. Aug. Schneegans calls attention to peronin, which has recently been introduced by Merck as giving promise of extensive use as a new narcotic. It is the hydrochloric acid salt of morphine benzylester, $C_{17}H_{18}NO_2.O.C_6H_5CH_2HCl$, forms a voluminous white powder, and consists of very fine prismatic crystals. It is soluble in water at 15° to the extent of 7.5 p. in 1000, but is readily dissolved by 10 p. of boiling water, 218 p. of 95 per cent. alcohol, 100 p. of methyl alcohol, and 390 p. of chloroform, while in acetone, ether, and amyl alcohol, as well as in dilute mineral acids, it is practically insoluble. It has proved a good narcotic, somewhat weaker than morphine, but showing the disagreeable properties of that alkaloid in a much smaller degree. Dr. Schröder, who has tried the effect of peronin on several persons, ranks it intermediate in its therapeutic properties between morphine

and codeine, and claims it to be preferable to the latter in that it produces a sounder sleep and causes no excitement.—Pharm. Rev., May 1897, 98; from Jour. d. Pharm., *24*, 59.

Codeine—Characters of the Alkaloid and its Salts.—The requirements demanded concerning the solubility, amount of water of crystallization, and behavior towards reagents, of codeine and several of its salts, have induced R. Tambach and F. Henke to undertake an examination, the results of which they have communicated to "Merck's Report" (May 15, 1897, 305–306). Omitting the details of the authors' experiments, these results are briefly as follows:

Codeine ($C_{18}H_{21}NO_3+H_2O$) is soluble in 118.35 parts of water at 15° C., and loses 5.64 per cent. of its weight at 100° C. The U. S. P., Ph. G. II, and B. P. give its solubility in 80 p. of water; the Ph. Gall. in 60 p. at 15° C.

Codeine hydrochlorate ($C_{18}H_{21}NO_3HCl+2H_2O$) is soluble in 25.88 p. of water at 15° C., and loses 9.60 per cent. of its weight at 100° C. The Ph. Hung. mentions that this salt is difficultly soluble in cold water.

Codeine phosphate ($C_{18}H_{21}NO_3.H_3PO_4+1\frac{1}{2}H_2O$) is soluble in 3.2 p. of water at 15° C., and loses 6.70 per cent of its weight at 100° C. The Ph. G. III., requires that it shall be easily soluble in water.

Codeine sulphate ($(C_{18}H_{21}NO_3.)_2.H_2SO_4.+5H_2O$, is soluble in 33.3 parts of water at 15° C., and loses 11.50 per cent. of its weight at 100° C. Beilstein mentions that it should be soluble in 30 parts of water.

Concerning the various pharmacopœial tests, the author finds that the *sulphuric acid test*, requiring colorless solution under certain conditions and proportions, is of no value for the preparations normally found in the trade, since these usually contain traces of other opium bases that determine colored solutions. The *nitric acid test* of Hager, according to which codeine should yield with a 25 per cent. nitric acid a colorless solution, is found to be inaccurate. The authors find that under this test the codeine is converted into nitrocodeine, a preparation which changes to yellow, and eventually to reddish-yellow. The nitric acid test is likewise unavailable for determining the presence of morphine. The authors propose for the detection of 10 per cent. of morphine the test of the Ph. G., III, which is as follows: A solution of a fragment of potassium ferricyanide in 10 Cc. of water treated with 1 drop of ferric chloride solution, is not immediately colored by 1 Cc. of a solution of 0.01 Gm. of pure codeine in 1 Cc. of warm hydrochloric acid.

Dicodeylmethane—A Condensation Product of Codeine by Formaldehyde.—The Color Works at Höchst have introduced a condensation product obtained by digesting an acid solution of codeine with formaldehyde, precipitating the blue-fluorescent solution with soda, washing and drying the precipitate, which they have named dicodeylmethane. It is said to be

formed by the union of 2 mol. of codeine and 1 mol. of formaldehyde, with elimination of water. The hydrochlorate of the new condensation product is readily soluble in water and in alcohol, melting at 140°, and is said to be medicinally active.—Ztschr. Oest. Apoth. Ver., Jan. 20, 1897, 52.

Tropacocaine—Value as a Substitute for Cocaine.—Vamony proposes to substitute tropacocaine for cocaine in medical practice on the ground that it is less than half as toxic as cocaine, while the anæsthesia it produces is as rapid and more lasting. He observes that tropacocaine gives rise to little or no myridiasis when employed in the eye. For general use he prescribes the following solution: Chlorhydrate of tropacocaine, 30 centigrammes; sodium chloride, 6 centigrammes; distilled water, 10 grammes.—Rév. de Thérap. Med. Chirurg., lxiii., 188; from Therap. Woch.

Amorphous Cinchona Alkaloids—Natural Occurrence in the Leaves.—Pasteur and others have heretofore held that "chinoidin" or "quinoidine" is simply an amorphous decomposition product of the crystallizable cinchona alkaloids; but Dr. de Vrij, after fifty years of study and investigation, holds an opinion that is diametrically opposed to the views of Pasteur. He believes that quinine and the other crystallizable alkaloids are formed from the quinoidine. The change, he says, takes place in the leaves, from which he was able to isolate the mixture of amorphous alkaloids known as quinoidine, but no crystallizable alkaloid. In order to ascertain definitely the absence of crystalline alkaloid, Prof. Behrens, at his request, examined microscopically the precipitate resulting upon the application of the herapathite test. Neither the one nor the other crystalline herapathite could be detected. The leaves examined were those of *Cinchona Ledgeriana* from the Dutch plantations. The alkaloids were extracted by means of the lime process. For details of the process the original will have to be consulted, in Nederl. Tijdsch. voor Pharm. Chem., en Tox, 1896.—Pharm. Rev., Aug. 1896, 186.

Quinine—Fluorescence Concealed by. Phenacetin.—F. Sesbini and R. Campani have made the interesting observation that the presence of phenacetin conceals the fluorescence of sulphuric acid solutions of the cinchona alkaloids, especially when dilute. Aqueous solutions of phenacetin are colored yellow on the addition of chlorine water and ammonia, but mixtures of quinine and phenacetin are colored light-blue.—Drug. Circ., Dec. 1896, 299; from L'Orosi.

Quinine—Modification of Thalleioquin Test.—F. S. Hyde states that a solution of calcium hypochlorite gives more satisfactory results in the thalleioquin test than either chlorine or bromine water, the results being more certain and brilliant. After acidulating the quinine solution in a test tube with one drop of diluted sulphuric acid—1 : 4—the hypochlorite solution is added through a small filter until the blue fluorescence just disap-

pears and the liquid acquires a faint golden tint; then, upon addition of a few drops of diluted ammonia—1 : 3—a clear emerald-green color will appear in presence of quinine, the tint being far more brilliant than by either of the other agents mentioned.—Jour. Amer. Chem. Soc., 1897, 331.

Quinine—Alkalimetric Titration.—A. H. Allen directs attention to the divergent behavior of the salts of quinine with inorganic acids towards methyl orange. Thus the ordinary quinine sulphate of commerce containing two molecules of the base to one of the acid, although practically neutral to brazil-wood, cochineal and logwood, is strongly alkaline to methyl orange. The point of neutrality when titrating quinine with the first-named indicators is thus reached when the neutral sulphate is formed; but with methyl orange not until the acid sulphate results.—Pharm. Journ., Aug. 22, 1896, 174; from Analyst, xxi, 241.

Quinine Sulphate—Pharmacopœial Tests of Purity.—In view of the great progress that has been made in the greater accuracy of testing the salts of quinine since the publication of the last British Pharmacopæia, and the altered condition of the supply of cinchona bark, which render it easy to deliver quinine of a far higher degree of purity than formerly, David Howard briefly sums up the work of the eminent chemists who have devoted so much skill to the subject. The two tests, that have in a more or less improved form been adopted, are the original test proposed by Liebig, which consists in shaking the quinine sulphate with ether and ammonia, and the ammonia test of Kerner, which either in its original form or with modifications is the most widely adopted of any. In the original "ether test," quinine containing upwards of 10 per cent. of cinchonidine sulphate will pass as pure, while Kerner's "ammonia test" can only give empirical results, owing to the difficulty of dissolving out cinchonidine sulphate when combined with quinine sulphate. This difficulty is the more serious as the crystallization of quinine sulphate from an impure solution is never homogeneous, the salt deposited varying according to the temperature, as pointed out by Prunier; for quinine sulphate of approximate purity will crystallize out from a strong solution until 50° C. is reached, below which temperature cinchonidine sulphate contaminates the quinine sulphate in an increasing ratio. Furthermore, the more rapidly the salt has been crystallized in the factory, the more completely the quinine and cinchonidine sulphates will have crystallized out together. Simple agitation of the quinine sulphate to be tested with cold water, as prescribed by Kerner's test given in the Ph. Germ., II, therefore results in the solution of the outside of the crystals of the mixed sulphates, and especially of the portions last deposited. To obviate this difficulty the sulphate may be effloresced by heat, and the interior of the crystals thus exposed to the solvent: a method which has been adopted in the U. S. P.; or, the sulphate may be treated with hot water and the mixture cooled down and maintained at the normal temperature

with frequent agitations till the danger of supersaturation is over. This method is adopted in the "Codex Francais," and the most suitable temperature, according to Hesse and Weller, is 60° C., which, according to Prunier, should not be exceeded. The Ph. Germ. III., on the other hand, has adopted a combination of the two alterations of the ammonia test, directing that the sulphate shall be exsiccated, then heated with water and cooled.

If the ammonia test be adopted after a preliminary heating of the quinine sulphate in water, the greatest care must be taken to avoid imperfect deposition of the dissolved quinine, so that the results may not show an apparent excess of impurities. Another precaution to be taken is to establish the absence of ammonium sulphate or sodium sulphate, the presence of which, to the extent of 0.5 per cent., diminishes the solubility of the quinine sulphate in such degree that its solution will hardly give a precipitate with ammonia.

As regards the ether test, if carried out under certain modifications, it is in the experience of Mr. Howard, far more certain in its results than the ammonia test, unless the latter is carried out by very experienced operators. Prunier has pointed out a direction in which great advantages can be obtained from the ether test, which are impossible with any other. He has shown that if a solution of impure quinine sulphate is cooled down slowly to 50° C., and maintained at that temperature with frequent agitation for some time, a very large proportion of the quinine is crystallized, usually containing not more than 2 per cent. of cinchonidine. If it be then filtered at that temperature the solution will contain within 2 per cent. of the total cinchonidine. If it be then evaporated to a small bulk and the magma obtained, shaken with just enough ether and ammonia to produce a momentary solution, a crystallization will form which bears a definite relation to the cinchonidine contained in the original sample. It is true that the whole of the cinchonidine present is not contained in the crystal, but if the crystal does not amount to more than 2 per cent. of the sulphate, very little more can be obtained by re-crystallization. If it exceeds that amount it is desirable to repeat the process with the sulphate crystallized at 50° in any case where it is required to have a full comparison of the contained impurities. As is always the case when cinchonidine crystallizes from ether in the presence of quinine, it will contain from 20 to 30 per cent. of quinine, according to the proportions of the two alkaloids in the solution. On the other hand, ethereal solution of quinine will dissolve a proportion of the cinchonidine considerably in excess of the normal solubility of the alkaloid in ether.

There is one difference between the two tests which should be noted. The ether test gives no indication of the presence of hydroquinine. This little-known alkaloid is generally present in commercial quinine sulphate to the extent of from 2 per cent. to 4 per cent. But the author does not

regard its presence to this extent as of much importance. In fact the author considers it a grave question if it is wise to insist on the use of the pure salt in commerce. For such a salt the test of the Ph. Germ. III. answers admirably. But to obtain pure quinine sulphate increases the expense greatly beyond the proportion of impurities removed, and those impurities are not only innocuous, but have the same therapeutic effects as quinine, though seemingly in a lower degree. The result of an over-severe test is that a second quality is offered in the market, which is habitually used. In Germany the Ph. Ger., II., is far more used than the Ph. Ger., III. It is far more effective to have a standard which can be, and is, insisted on.—Pharm. Journ., Dec. 12, 1896, 505–507.

Quinine Sulphate—New Tests of Purity.—Melchior Kubli states that none of the tests usually employed for the detection of the commonly-occurring cinchona alkaloids in commercial quinine sulphate are satisfactory, more especially Kerner's ammonia test as modified in the German Pharmacopœia (III), Schäfer's oxalate test, or De Vrij's chromate test. Cinchonidine as now existing in quinine sulphate, prepared from cultivated cinchona bark, is said to give little or no reaction with Kerner's original ammonia test. The author suggests two tests for the detection of the other cinchona alkaloids in quinine sulphate, one of which he calls the water test, and the other the carbon dioxide test.

The Water Test.—This depends on the fact that the sulphates of the cinchona alkaloids, other than quinine, are more soluble in water than quinine sulphate, whilst, on the other hand, their alkaloids are less soluble in water than quinine alkaloid, so that on setting free the base with an alkali from a water solution of a known weight of the sulphate, the quantity of water necessary for the solution of the base is a measure of the purity of the quinine salt.

The test is carried out in the following manner: 1.793 grammes of quinine sulphate which have been dried at 40° to 50°, and contain, therefore, 4.6 per cent., or two molecules of water of crystallization, or an equivalent amount of the crystalline salt, are dissolved in 60 grammes of boiling water contained in a tared flask, the heating being continued for five minutes. Water is then added from a burette until the total weight amounts to 62 grammes. The contents of the flask are then cooled to 20° with frequent agitation, and allowed to stand for half an hour at 20° C. It is then filtered through a dry filter, and to 5 Cc. of the filtrate exactly three drops of a 10 per cent. solution of pure sodium carbonate are added. Water at 20° C. is then run in from a burette until the opalescence caused by the suspended alkaloids has disappeared. Chemically pure quinine sulphate requires exactly 10 Cc. distilled water at 20° C. to cause the opalescence to disappear.

In these experiments, for every increase of 1 per cent. in the amount of cinchonidine sulphate there is a corresponding increase of 0.4 Cc. of

water required. Mixtures containing varying amounts of three alkaloids other than quinine all showed more or less a concordant rise in the amount of water required to dissolve the opalescence at first produced.

The Carbon Dioxide Test.—When sodic carbonate is added to a solution of quinine sulphate saturated at the ordinary temperature, the precipitated alkaloid is very easily soluble in sodic bicarbonate, and on passing a stream of carbonic dioxide into the solution the quinine separates as neutral carbonate in beautiful bunches of needles. Quinine carbonate is only very slightly soluble in water, effervesces with acids, readily dissolves in alcohol, and is very slightly alkaline to litmus paper. In the presence of cinchonine, cinchonidine, and quinidine, either singly or together, the separation of the crystals is lessened and delayed, and if the amount of the other alkaloids exceed a certain limit is prevented altogether, but hydroquinine scarcely exerts the same influence.

The carbon dioxide test is carried out in the following manner:—5 Cc. of the saturated solution of the quinine sulphate, prepared in the same way as in the water test, are precipitated with three drops of neutral sodic carbonate, and the precipitate dissolved by adding 5 Cc. of sodic bicarbonate (free from carbonate). Carbon dioxide is then passed through the solution in a stream of about 80 to 100 bubbles per minute for thirty minutes at a temperature of 15° C.; it being essential that the gas be free from atmospheric air before it is passed through the quinine solution. The cylinder is then gently shaken until the volume of the supernatant liquid remains constant, which with a voluminous precipitate occupies thirty minutes or more. The contents of the cylinder are then placed in a measure graduated to $\frac{1}{10}$ or at least $\frac{1}{5}$ Cc., and allowed to stand for from one to two hours until clear.

With samples of quinine sulphate containing from 1 to 3 per cent. impurity, the liquid frequently requires to stand until next day, the separation being hastened by frequent agitation.

The quantitative determination of the amount of alkaloidal impurity in quinine sulphate being, as in the ammonia test, only possible within narrow limits by the water test, while the carbon dioxide test will give directly the percentage of impurity, the author believes that by a combination of the two it will be possible to ascertain the nature of the impurity with comparative certainty. According to these two methods of testing, chemically pure quinine is to be regarded as such if it requires 10 Cc. of water in the water test, and if it gives a volume of quinine carbonate amounting to 1.4 to 1.5 Cc. in the carbon dioxide test. An impurity of 1 per cent. of other alkaloids requires 11 Cc. of water, and gives a precipitate of 1.8 to 2.0 Cc. of which only a part is granular; a 2 per cent. impurity requires not more than 12 Cc. of water, and gives a granular precipitate of not less than 1.4 Cc.; while 3, 4 and 5 per cent. impurity should not exceed 13, 14 and 15 Cc. of water respectively, and give not less than 1 Cc., 0.8 Cc. and 0.5 Cc.

of granular precipitate of carbonate.—Pharm. Journ., Aug. 22, 1896, 157–158; from Pharm. Zeit. f. Russ., *34*, Nos. 38–47.

Quinine Sulphate—Efflorescence of the Crystallized Salt.—Referring to Mr. Howard's paper, A. J. Cownley observes that there appears to be still some uncertainty amongst many chemists respecting the efflorescent nature of crystallized quinine sulphate. He had called attention to this peculiar character of quinine sulphate twenty years ago (see Proceedings 1877, 303), and recapitulates the facts then established in his present paper. It was because of the results of the experiments then made that he has always advocated that the official quinine sulphate should be a salt of constant composition as regards its water of crystallization; in fact, it should be the air dried salt, having the composition $(C_{20}H_{24}N_2O_2)_2,H_2SO_4,2H_2O$, and containing 4.6 per cent. of water. The objection to the air-dried sulphate is a purely fanciful one, namely, that it has lost the fine crystalline appearance of the fully crystallized sulphate. As it is, the variation in the amount of water in commercial quinine sulphate, based upon an examination of forty samples, is from 8.1 to 15.95 per cent. of water of crystallization.

Mr. Cownley, furthermore, expresses the hope that the empirical tests adopted in the American and Continental Pharmacopœias will not be made official in the B. P., but that satisfactory methods may be suggested for the detection and determination of the other alkaloids in commercial quinine sulphate.—Pharm. Journ., Dec. 19, 1896, 525.

Quinine Sulphate—Rapid Re-Absorption of Water.—Corroborating the facts concerning the unstable character of crystallized quinine sulphate pointed out by Mr. Cownley, and supporting most emphatically his contention, that the sulphate with two molecules of water should replace the one now official in the B. P., E. H. Farr and R. Wright give an instance of the rapidity with which anhydrous quinine sulphate re-absorbs water: One Gm. of the anhydrous salt exposed to the air in the laboratory absorbed 0.015 Gm. of water in seven minutes. It must therefore be cooled in a desiccator, and weighed as quickly as possible. *Quinine hydrochlorate* is even more hygroscopic. In six minutes a quantity of .626 Gm. of the anhydrous salt exposed to the air gained .017 Gm., and in three hours it had resumed its original weight with two molecules of water.—Pharm. Jour., Mar. 6, 1897, 203.

Quinine Glycerophosphate—Characters, etc.—To the glycerophosphates previously described (see Proceedings 1896, 769), the glycerophosphate of quinine must now be added. It contains 68 per cent. of quinine, and its composition is represented by the formula $C_3H_7O_3.PO_3.(C_{20}H_{24}N_2O_2)_2$. It occurs in acicular crystals, which are easily and clearly soluble in hot water and in alcohol. Combining the therapeutic properties of quinine and glycerophosphoric acid, it is one of the most efficacious of nervine tonics,

and is said to be indicated in all cases of malnutrition, accompanied by malarial troubles, in neuralgia, and in convalescence following serious febrile diseases. It is best administered in form of pills containing about one and one-half grains of the glycerophosphate each, one to three being given thrice daily.—Merck's Rep., May 1, 1897, 279; from Therap. Wochenschr., iv., 279.

Benzoyl Quinine—Formation and Characters.—By the action of benzoyl chloride on pure dry quinine, A. Wunsch has obtained a derivative, in which the benzoyl radicle displaces an atom of hydrogen, forming the compound $C_{20}H_{23}(C_6H_5CO)N_2O_2.HCl$. The new compound, which the author calls "benzoyl quinine," forms basic and acid salts like quinine, the basic compounds being more readily crystallized than the acid ones. Full details are given concerning the method of preparing the derivative, as well as of a number of its compounds, which are described.—Pharm. Ztg., 1896, 563.

Quinine Chlor-carbonic ester—A Tasteless Quinine Compound.—According to a German patent, quinine chlor-carbonic-ester—$O.Cl.CO.C_{20}H_{23}N_2O_2$—is produced when phosgone, either as gas or dissolved in benzene, toluene, etc., is caused to act upon anhydrous quinine, either dry, or dissolved, or suspended in a proper medium. The crystalline mass formed is washed with benzene and then digested with water to remove quinine hydrochlorate, which is also formed. The new compound, crystallized from alcohol, constitutes fine colorless needles, which melt at 187°–188°; it is less basic than quinine, and gives in solution the thalleioquine reaction. It is said to dissolve with sufficient rapidity in the stomach to insure prompt absorption, and to have the advantage over quinine in being free from bitter taste.—Pharm. Ztg., 1897, 192.

Factitious Quinine—Examination.—W. A. Puckner has examined a sample of substance marketed under the name "Flora China," and claimed to be "pure quinine sulphate," but to be tasteless, and to do what bitter quinine does. It appears to be a stupendous fraud, since it proved on analysis to be pure and simply "crystallized calcium sulphate," or "gypsum." In appearance the substance resembled quinine sulphate, and it certainly was, as claimed, entirely tasteless. The enterprising manufacturers reside in Florida.—West. Drug., Sept., 1896, 393.

Quinine—Use of Apple-pulp to Mask the Taste.—Schneider proposes to use the fleshy portion of ripe apples to render quinine palatable and agreeable. He advises some scraped apple (preferably acid) to be put into a tablespoon, the quinine placed upon it and covered with another layer of scraped apple. It is stated that taken in this way quinine does not leave the slightest bitter taste in the mouth.—Merck's Report, July 15, 1896, 258; from Pharm. Ztg., xli, 393.

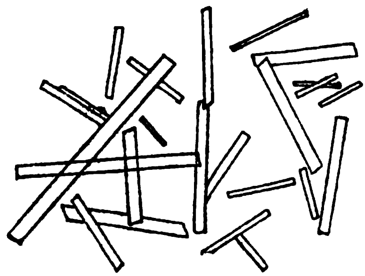
Cinchonine—Alleged Conversion into Cinchonidine.—In experimenting

upon the action of alkalies on the cinchona alkaloids, W. Koenigs and A. Husmann claim, in a paper recently read before the German Chemical Society, to have converted cinchonine into cinchonidine by the long-continued action of boiling amyl-alcoholic potash. For the purpose of examining into the correctness of their claim, Dr. B. H. Paul and A. J. Cownley have carried out the treatment of cinchonine with potash exactly in the manner described by Koenigs and Husmann. This, as described by the latter, was to treat 4 grammes of cinchonine for from 15 to 16 hours with 2 grammes of potash dissolved in 120 cubic centimeters of amylic alcohol. After the action, the bases were removed from the amylic alcohol with hydrochloric acid, and the bases obtained by precipitation with soda were dissolved in the least possible quantity of boiling alcohol. After cooling, about 1 gramme of unaltered cinchonine crystallized out. The mother liquor was neutralized with hydrochloric acid, the alcohol expelled, and after dilution with water to 150 Cc., 5 grammes of Rochelle salt were added. The separated tartrate was decomposed with soda, and the alkaloid crystallized from weak alcohol. In this way 0.2 gramme of base was obtained, which, according to the authors, had the melting point, rotatory power, and composition of cinchonidine. An organic analysis gave numbers corresponding to the formula for cinchonidine, $C_{19}H_{22}N_2O$. A considerable part of the cinchonine is also said to be converted into bases which are soluble in ether.

Knowing from experience when dealing with cinchona alkaloids of the great difficulty in separating one cinchona alkaloid from another in order to obtain an alkaloid of perfect purity, Paul and Cownley were somewhat skeptical as to the result being the conversion of one alkaloid into the other, more especially as Koenigs and Husmann merely claim to have converted 5 per cent. of the cinchonine into cinchonidine. Also the methods described for identification of the alkaloid are not very discriminating, especially in attempting to identify the alkaloid from the results of the percentage of carbon and hydrogen obtained in an organic analysis. They were, therefore, not surprised at their failure to corroborate, by their experiments, the results claimed to have been obtained by Koenigs and Hüsmann, and express the opinion that if these experimenters really obtained cinchonidine, they must have operated upon a cinchonine that had not been sufficiently purified.—Pharm. Jour., Feb. 20., 1897, 141.

Cocaine—Insolubility in Vaseline and Lard.—C. Edward Sage calls attention to the insolubility of cocaine in vaseline and lard. Made into an ointment in proportion of 1 part of alkaloid to 20 of vaseline (by the aid of heat? Rep.), a thin layer when examined under the microscope gave, under a 1/8 inch objective, the field shown in the accompanying cut (Fig. 68). The vaseline examined in the same manner showed no crystals, and the alkaloid used was proven to be pure. An ointment made with lard

FIG. 68.



in the same manner and proportions also showed well-defined crystals after standing two hours.

Solutions of Cocaine in Olive Oil and Castor Oil were also made in the same manner, but these were found to be stable. It appears from these results that neither vaseline nor lard is suitable for the preparation of cocaine ointment, unless the cocaine be used in form of hydrochloride and dissolved in a little water before admixture.—Pharm. Jour., July 11, 1896, 28.

Cocaine—Application in Microscopy.—Cooner has applied cocaine in mounting on permanent slides active rotifers or contracting animals, such as the *Bryozoa*, as follows: Several colonies of the Bryozoa are placed in a watch-glass with 5 Cc. of water, and as soon as the animals are expanded, one or two Cgms. of cocaine hydrochloride is dropped on the edge cf the water at distant points. In fifteen minutes the narcotic influence is sufficient, as may be tested by touching the tentacles with a needle. One per cent. chromic acid is now poured in to fill the glass, and left for half an hour, then poured off and water substituted. The preparation is next put through alcohols of varying strength and hardened in the usual way, oil of lavender being recommended for clearing. The *Melicertas* are very resistant to this method, and require a much stronger dose of cocaine, so that killing cannot be done with chromic acid, since the mineral acid precipitates chromate of the alkaloid from very strong solutions. A 20 per cent. solution of formalin is therefore substituted.—Amerc. Microsc. Journ., xvii, 95.

Cocaine and Aluminum Citrate—Preparation.—A new double salt, cocaine and aluminum citrate, is obtained in the form of a fibrous crystalline precipitate when solutions of cocaine citrate and aluminum citrate are mixed together. The new double salt, which is composed of 1 molecule of cocaine and 3 molecules of aluminum citrate, is bitter, easily soluble in hot water, with some difficulty in cold water, and insoluble in alcohol and ether. It is recommended medicinally on account of its astringent and anæsthetic properties.—Zeitschr. Oest. Apoth. Ver., Jan. 10, 1897, 29.

Caffeine—Estimation in Tea and Coffee.—The following method for the estimation of caffeine in tea or coffee is suggested by A. Hilger and A. Juckenack: 20 Gm. of finely comminuted tea or coffee are soaked in 900 Gm. of water at the temperature of the room in a beaker for several hours, then thoroughly exhausted by boiling, replacing the water as it evaporates—3 hours being required for green coffee, and only 1½ hours for roasted coffee or for tea. The mixture is then allowed to cool to

60°–80°, 75 Gm. of *Liquor Aluminii Acetici* are added, and, while stirring, 1.9 Gm. of sodium carbonate. The mixture is boiled for another five minutes, and after cooling the total weight is brought to 1020 Gm. The mixture is then filtered. Of the absolutely clear filtrate, 750 Gm., corresponding to 15 Gm. of substance, are taken, 10 Gm. of aluminum hydroxide and a magma of filter paper and water are added, and the mixture is evaporated on a water-bath to dryness with occasional stirring. The residue is completely dried in a water-bath drying oven and then exhausted with carbon tetrachloride in a Soxhlet extraction apparatus for eight hours. The carbon tetrachloride remains perfectly colorless, and the white crystallized caffeine can be weighed as pure after drying.

The *carbon tetrachloride* used should first be purified by shaking it three or four times with a 5 per cent. soda solution, then three times with water, drying with calcium chloride, and fractionating.—Pharm. Rev., April, 1897, 77; from Apoth. Ztg., *12*, 145.

Caffeine—Estimation in Tea.—The following method for the estimation of caffeine in tea is proposed by Keller: In a wide-mouthed separating-funnel, 6 Gm. of dried whole tea leaves are introduced with 120 Gm. of chloroform; after a few minutes, 6 Cc. of aqua ammoniæ are introduced, and the mixture is well shaken. The leaves swell up and the caffeine is taken up by the chloroform. The mixture is allowed to stand for three to six hours till clear, when 100 Gm. of the chloroform, representing 5 Gm. of the tea, are drawn off, filtering through a small filter (wetted with chloroform) into a small flask. The chloroform is distilled off, and the residue is covered with 3 to 4 Cc. of absolute alcohol, which is allowed to evaporate while heated on a water-bath. The crude caffeine is purified by dissolving in a mixture of 7 Cc. of water and 3 Cc. of alcohol; after solution has taken place, 20 Cc. of water are added, the flask corked, and the contents well shaken, which causes the chlorophyl to ball up, enabling the operator to afterward remove it by filtering through a small wetted filter. After rinsing the flask and filter, the filtrate is evaporated to dryness and weighed. The weight of the residue, multiplied by 20, gives the percentage of caffeine in the sample.—Pharm. Era, April 1, 1897, 391.

Caffeine—Extraction by Solution of Sodium Salicylate.—The observation of Tanret, that certain organic salts, such as salicylates and benzoates, act as solvents upon caffeine, has led George to employ a one per cent. solution of sodium salicylate for the extraction of that alkaloid from tea and coffee. Five Gm. of the finely powdered sample is mixed with fine sand, and exhausted by percolation with a one per cent. solution of sodium salicylate, until a colorless liquid is obtained. The percolate is then evaporated to about 50 Cc., and extracted four successive times with chloroform; this solvent is finally distilled off, leaving the alkaloid in a pure white state for weighing.

Caffeine—Investigation of Some Homologues.—Prof. E. Schmidt reports

the results of the investigation of some homologues of caffeine, undertaken by one of his students to complete the somewhat imperfect account given of ethyl-theobromine by L. Philips. The production of

Ethyl-Theobromine (or Homo-Caffeine) was effected by the method applied by E. Schmidt and H. Pressler for converting theobromine into caffeine. A mixture of the potassium compound of theobromine with an alcoholic solution of ethyl iodide was heated for six hours in a water-bath in a flask capable of bearing pressure. The product of the reaction was then mixed with water, the filtered solution evaporated, and the residue extracted with chloroform. In this way a satisfactory yield of ethyl-theobromine or homo-caffeine was obtained, forming anhydrous silky crystals, and capable of being sublimed when cautiously heated. Its solubility in various menstrua closely resembles that of caffeine. The melting point is from 164° to 165° C., though Philips has stated it is above 270° C. The reaction of ethyl-theobromine with chlorine water and ammonia is similar to that of caffeine, and is due to formation of amalic acid. The salts of ethyl-theobromine also resemble those of caffeine in being decomposed by solution in water so completely that the amount of acid in any of the salts may be ascertained by titration with decinormal alkali solution. The following salts were prepared and examined:

Hydrochloride, $C_7H_7(C_2H_5)N_4O_2,HCl + 2H_2O$.—Acicular crystals, losing their water at 100° to 120° C., and also the whole of the hydrochloric acid.

Hydrobromide, $C_7H_7(C_2H_5)N_4O_2,HBr$.—Transparent needles.

Acetate, $C_7H_7(C_2H_5)N_4O_2(C_2H_4O_2)_2$.—Transparent needles, losing the whole of their acid at 100° C.

The gold chloride salt melts at 226° C., the platino-chloride above 240° C. Both the hydrargyro-chloride and the hydrargyro-cyanide crystallize in needles. The compound with silver nitrate, $C_7H_7(C_2H_5)N_4O_2$-$AgNO_3$, forms fine long needles.

Propyl-Theobromine, $C_7H_7(C_3H_7)N_4O_2$, is formed in the same manner as ethyl-theobromine; it crystallizes in needles, melts at 136° C., and can be sublimed by cautious heating.

Isobutyl-Theobromine, $C_7H_7(C_4H_9)N_4O_2$, forms white needles very sparingly soluble in cold water, and melting at 129° to 130° C. With chlorine water and ammonia they give the amalic acid reaction. The gold and platinum double salts of both the last-named caffeine homologues are crystallizable.—Pharm. Journ. Jan. 9, 1897, 21; from Apoth. Ztg., xii., 5.

Citrated Caffeine—Examination of Commercial Samples.—Prof. Wm. Puckner reports upon the examination of commercial samples of citrated caffeine, carried out by one of his students, Mr. M. A. Harper, with the view to determine to what extent the supply in the market responded to the pharmacopœial requirements. The three samples examined contained

46.32, 48.42 and 47.20 per cent. of anhydrous caffeine, this being determined by extracting the aqueous solution with chloroform in the usual manner, evaporating spontaneously and drying to constant weight over sulphuric acid. While these samples, in caffeine content, may be said to agree fairly with the official preparation, in neither case did "one part of citrated caffeine form a clear solution with about three parts of water," but instead formed a pasty mass, becoming solid on standing; further, the samples were not entirely "soluble in a mixture of two volumes of chloroform and one volume of alcohol." In order to study these discrepancies more fully a sample of citrated caffeine was prepared, adhering strictly to the official formula, and it, tested for solubility as before noted, corresponded in its behavior to that observed for the commercial samples. It was now found that if one part of *either* of the *four* specimens was mixed with three parts of water and this mixture *gently warmed* a clear solution would result. This result would seem sto hcw that the official description should be changed so as to read: One part of citrated caffeine mixed with three parts of water and this mixture gently warmed will yield a clear syrupy solution.—West. Drugg., June, 1897, 253.

Caffeïdine Carbonic Acid—Reconversion into Caffeine.—According to Malz and Andreasch caffeine is converted into caffeine carbonic acid when treated with diluted alkali, and when its solution is then heated it is decomposed into carbon dioxide and caffeïdine. E. Fisher and O. Bromberg have now succeeded in reversing these reactions. They find that caffeïdine carbonic acid can be reconverted in caffeine when it is heated with phosphorus oxychloride, but an attempt to introduce carbonic acid into caffeïdine was not successful.—Pharm. Rev., May, 1897, 93; from Berichte, 30, 219.

Coffeiniodol—Preparation and Character.—A new substitute for iodoform, coffeiniodol, is obtained by the interaction of alcoholic solutions of iodol and caffeine in molecular proportions. It constitutes a light-gray, odorless and tasteless crystalline powder, and is almost insoluble in all the ordinary solvents. Externally it may be used like iodol and iodoform, while internally it is now and then useful, in the same doses as iodine, as a substitute for potassium iodide.—Zeitschr. Oest. Apoth. Ver., July 10, 1896, 533.

Theobromine—Determination in Cacao.—Emminger recommends the following method for the determination of theobromine in cacao: Ten grammes of the material, in fine powder, is digested with 150 parts of petroleum spirit; the residue is then dried and a weighed portion boiled with 100 Cc. dilute sulphuric acid (3.4 per cent.) in a flask fitted with a reflux condenser for about half an hour, or until the formation of cacao red is completed. The contents of the flask are then turned into a beaker, and while hot exactly neutralized with the previously calculated quantity

of baryta, the whole is evaporated to dryness in a basin with some sand, and the residue extracted in a Soxhlet apparatus, with 150 parts of chloroform for five hours, the chloroform then distilled off, and the residue dried at 100° C. This residue is then washed with not more than 100 Cc. carbon tetrachloride, which dissolves fat and caffeine: the theobromine being quite insoluble in carbon tetrachloride at 18° C., is collected on a filter, dissolved in boiling water, the solution filtered, evaporated, and the residue weighed. By this method the theobromine in different kinds of cacao was found to vary from 1.05 to 2.34 per cent, and the caffeine from 0.05 to 0.36 per cent. Theobromine is soluble in 736.5 parts water at 18° C., 136 parts at 100° C.; in 818 parts boiling absolute alcohol, 21,000 parts ether at 17° C., 2710 parts boiling chloroform, and 5808 parts at 18° C. Theobromine begins to sublime at 220° C. without melting, while caffeine sublimes at 180°, and begins to melt at 220°. By warming theobromine with alkalies, earthy or hydrated lead oxide, for any length of time, it is more or less decomposed.—Pharm. Jour., Oct. 3, 1896, 289; from Forschungs Berichte, 1896, 275.

Pilocarpine—Constitution.—In a recent communication in "Ber. Deut. Pharm. Ges." (vi., 164), P. Knudsen expresses doubt as to the constitution of pilocarpine elaborated by Hardy and Calmels. These authors have claimed that, starting from pyridine lactic acid, which they state is obtained by the action of boiling water on pilocarpine, they were enabled to produce pilocarpidine, and this, on methylation, was converted into pilocarpine. Hence, they concluded that the pilocarpine molecule must be produced from trimethylamine and pyridine lactic acid. Knudsen has failed to synthetise pilocarpine on these lines. Starting with picoline *a*-lactic acid—the higher homologue of pyridine lactic acid—he could in no instance effect the synthesis of pilocarpine or pilocarpidine, and he considers, therefore, that their work needs revision.

Following up Knudsen's results, E. Merck has examined the action of methyl iodide on Harnack's pilocarpidine, but was unable to obtain pilocarpine, as stated by Hardy and Calmels; he merely obtained an isomer of pilocarpine, which is distinct from that base in being insoluble in water. Pharm. Journ., Feb. 27, 1897, 161.

Pilocarpine and Pilocarpidine—Investigations Concerning Origin, Association, Composition and Decomposition.—Petit and Polonovski, combining their researches on the jaborandi alkaloids, state that the greater part of the commercial salts of so-called "pilocarpine" are in reality a mixture of the salts of pilocarpine and pilocarpidine. This is notably the case with the nitrate, the nearly equal solubility of the two nitrates allowing them to crystallize together, so that nitrate was frequently met with containing 50 per cent. of pilocarpidine. This impurity may be readily detected by the lessening of the melting point, pure pilocarpine nitrate melting at 177°–178°, while a mixture containing 50 per cent. of pilocar-

pidine nitrate melts at 140°, and is completely decomposed at 150° C. Concerning the

Origin of Pilocarpidine, the authors combat the theory of Hardy and Calmels, that pilocarpidine is a decomposition product. They consider that it exists in the plant, since more or less of it is always found even when heat is entirely avoided, and neither strong alkalies nor acids are used in its preparation. Furthermore, operating under like conditions with different species of jaborandi, the yield of pilocarpidine varies between 5 and 75 per cent. of the total alkaloids; and lastly, it is usually found in greater proportion in the stems than in the leaves of the same plant. The authors have also determined that the

Isomerism of Pilocarpine and Pilocarpidine is reasonably certain. The figures obtained by ultimate analysis are so close that the physical characters are by far the most important points of difference between the two alkaloids. They observe, furthermore, that if pilocarpine is regarded as the betaine of pyridine *trimethyl*-ammonium-propionic acid, it is difficult to account for the fact that pilocarpidine, which does not, according to the views held by others, possess the anhydric group, but is pyridine-*dimethyl*-ammonium-propionic acid, can yet furnish an acid by hydrolysis in a precisely similar manner to pilocarpine (see *Pilocarpic* and *Pilocarpidic Acid*, under "Organic Acids").—Pharm. Journ., May 29, 1897, 466; from Journ. de Pharm., (6) 5, 482.

Pilocarpine Hydrochloride—Variation in Melting Point.—The opinion recently expressed in an American journal that the melting point, as given in the U. S. P., is the best means of ascertaining the purity of pilocarpine hydrochloride, leads Drs. B. H. Paul and A. J. Cownley to call attention to their recent observation that some samples of pilocarpine nitrate examined by them have been shown to differ considerably in their melting point (see Jaborandi—amount and character of alkaloids—under "Materia Medica"). It might, therefore, be inferred that the hydrochloride has in that respect an advantage over the nitrate, but an examination of two samples of hydrochloride as to the melting point gives indication that this also is a mixture of more than one chemical compound. Taking the melting point in a Roth apparatus, the authors found that two different temperatures might be read as the melting point, one at which the substance in the capillary tube first showed signs of partial liquefaction, and a higher point, at which the contents of the tube became entirely liquid. In the two samples these temperatures were identical, the beginning of liquefaction being at 192.7°, and a clear liquid resulting at 196.7°. This behavior appears to point to the probable presence of two substances in both of the samples, and there is consequently some uncertainty as to which of these bases has the medicinal action peculiar to jaborandi.—Pharm. Jour., Nov. 21, 1896, 437.

Pilocarpine Hydrochloride—Efficiency in Cases of Diphtheria.—Dr.

Barsky has obtained good results during a severe epidemic of diphtheria by the use of pilocarpine hydrochloride, either alone or in combination with antitoxin serum. The curative effects are attributed partly to the abundant salivation, which favors the softening and shedding of the false membrane, while the saliva is rendered acid and therefore unfavorable to the development of the growths; and partly to the increased perspiration and secretion of saliva, which help to eliminate the toxin; and also to the fact that pilocarpine gives rise to leucocytosis.—Pharm. Jour., Nov. 21, 1896, 439; from Gaz. des Hopit., 1896.

Brucine—Sensitive Reaction with Nitrites.—P. Pichard states that the coloration of brucine by hydrochloric acid, in the presence of a nitrite, furnishes an extremely sensitive reaction. One drop of the nitrite solution is mixed with one drop of hydrochloric acid, and the addition of a particle of brucine gives in about five minutes a coloration varying from vermilion red to light yellow. It is possible thus to detect one part of nitrous nitrogen in 640,000 parts of water, but nitrates give no result under similar conditions. This test is claimed to be as sensitive as those of Griess, Tromsdorff, and Piccini, whilst more sensitive than those in the presence of sulphites and hyposulphites.—Pharm. Jour., Oct. 31, 1896, 378; from Comptes rendus, cxxiii., 590.

Solnine—Distinction from Solanine.—In a former paper (see Proceedings, 1894, 1132) J. U. Lloyd had described the alkaloid of

Solanum Carolinense, coining for it the distinctive name of "solnine." He was then in doubt concerning the identity of this substance with "solanine," though believing it to be different if Wittstein's description of solanine is correct. He has since made accurate determinations of the melting point of solnine, and finds this to be 127.2° C., while the melting point attributed to solanine is given in the current literature at twice that figure, viz., 235.0° C.—Amer. Journ. Phar., Feb. 1897, 108.

Atroscine—Mydriatic Action.—Dr. Königshöfer has experimented in his ophthalmic practice with atroscine, the mydriatic alkaloid found by Hesse as being present in variable amount in the hyoscine hydrobromide (or scopolamine hydrochloride) of commerce (see Proceedings 1896, 812). He finds that, as compared with atropine and scopolamine, atroscine has an equal effect in dilating the pupil, but that the influence upon the accommodation is of double or four-fold advantage. It has a stronger action upon the ciliary muscles and allays irritation more effectually than other mydriatic alkaloids.—Ber. d. d. Chem. Ges., xxix., 1781.

Pseudaconitine—Properties as Obtained from Aconitum ferox.—In a previous communication Wyndham R. Dunstan and Francis H. Carr had given a preliminary account of pseudaconitine, the highly poisonous alkaloid of the aconite occurring in Nepaul, which is usually regarded as

Aconitum ferox, locally known as "bish" (bikh). Our previous knowl-

edge of this alkaloid is almost wholly due to the researches of C. Alder Wright, who, in conjunction with Luff, gave an account of its properties in a paper communicated in 1878 (see Proceedings 1879, 509). The authors have now made a very comprehensive examination and study of this alkaloid. The method of preparation finally adopted consisted in extraction from the drug with a mixture of methylic alcohol and amylic alcohol, in the proportion of 5 to 1, distilling off the methyl alcohol at a moderate temperature under reduced pressure, and shaking out the residual amylic alcohol solution with a 1 per cent. aqueous hydrochloric acid. After shaking this solution with ether to remove amyl alcohol, it was rendered alkaline with ammonia and shaken out with ether in the usual manner, being finally obtained pure by several recrystallizations from ether. It is so obtained in crystals belonging to the orthorhombic system, which are very brittle, and possess a good cleavage. It dissolves readily in alcohol, chloroform, and acetone, less readily in ether, very slightly in water, and scarcely at all in light petroleum. In its composition it corresponds very nearly with the formula proposed by Wright and Luff, namely, $C_{36}H_{49}NO_{12}$. They have prepared the hydrochloride, hydrobromide, hydroiodide and nitrate, of which the latter only was obtained in a crystalline condition. They have also studied the products of hydrolysis, which occurs in two stages, the first resulting in the production of *veratryl-pseudaconine* ($C_{34}H_{47}NO_{11}$), the second in that of *pseudaconine* ($C_{25}H_{39}O_8$), *veratric acid* being eliminated. *Pseudaconine* is amorphous, hygroscopic, easily soluble in water, chloroform, alcohol, and acetone, and less readily in ether. It is strongly alkaline to litmus paper, and forms salts with hydrochloric, hydrobromic, nitric, and sulphuric acids, none of which the authors succeeded in obtaining in a crystalline condition. When pseudaconitine is heated slightly above its melting point (178°), it effervesces, loses acetic acid, and is converted into

Pyropseudaconitine ($C_{34}H_{45}NO_{10}$).—This is an anhydride of veratryl-pseudaconine, amorphous, nearly insoluble in water, but readily in alcohol, chloroform and ether. Its salts appear to crystallize well, and appear to be non-poisonous.—Journ. Chem. Soc., March, 1897, 350–359.

Atisine—Preparation, Composition and Properties.—Hooper Albert Dickinson Jowett has prepared and studied the character and composition of atisine—the alkaloid of *Aconitum heterophyllum*—as well as of its salts. After a number of experiments with different solvents, he found a mixture of three volumes of methylic and one volume of amylic alcohol to be the most suitable for the extraction of the root, in fine powder, by percolation. On subjecting the percolate to distillation the methylic alcohol was completely removed. The residual amylic alcohol solution, after decantation from a very dark colored fat, was shaken out repeatedly with 1 per cent. aqueous sulphuric acid, and the acid solution, after shaking twice with

chloroform to remove amylic alcohol, was neutralized and concentrated on a water-bath. From this, after rendering it alkaline with aqueous sodium hydroxide, the alkaloid was shaken out with ether or chloroform, but obtained in an impure condition. It was finally obtained pure by a method of fractional precipitation, conversion into hydrochloride, and repeated crystallization. Operating upon 60 pounds of the drug, though the percentage yield was small (0.2 to 0.3 per cent.), the author obtained a sufficient quantity of the pure substance to establish its composition and to study its characters, and those of its salts. The results of his ultimate analysis establish the formula of the hydrochloride to be $C_{22}H_{31}NO_2,HCl$. The base was not obtainable in a crystalline condition, but simply as a colorless varnish, which is slightly soluble in water, freely soluble in alcohol, ether or chloroform, and insoluble in light petroleum. It readily undergoes decomposition when heated, becoming brown, and forming a resinous substance. It forms crystalline salts with hydrochloric and hydrobromic acids, which are readily soluble in water. The hydriodide and nitrate are also crystalline, but they are best obtained by double decomposition with the salts of the desired acid, and are only sparingly dissolved by water. The results of the author's investigations show that atisine does not present any close analogy to the alkaloids of the other and well-known species of aconite (*A. napellus, A. ferox, A. japonicum*). The molecule is apparently less complex and much more stable, and since it yields a hydrate when heated with alkalies or acids, it might be inferred that it is the anhydride of atisine monhydrate ($C_{22}H_{33}NO_3$). There would then be a relationship between these bases similar to that existing between aconine and pyraconine. Concerning the physiological action of atisine, Prof. Cash reports that in small doses it is not toxic, and that its action in some respects resembles that of aconine.—Journ. Chem. Soc., Nov. 1896, 1518–1526.

Berberine and Hydrastine—Processes of Manufacture.—Charles A. Lerre communicates the following processes for preparing the alkaloids of golden seal, both processes being based upon those previously communicated by J. U. Lloyd; they are simple, and dependent on apparatus at command.

First Process.—Two thousand pounds of golden seal in number 40 powder is exhausted with 80 per cent. boiling alcohol in a hot extraction apparatus, careful recovery leaving a dark syrup containing the total active ingredients. This is withdrawn and immediately added to five times its volume of warm water, and the whole allowed to stand 24 hours, by which time the resinoids have separated. The bright chocolate liquid is now acidified with sulphuric or hydrochloric acid in excess, and allowed to stand 24 hours, when most of the liquor may be decanted; the residual berberine salt is easily strained off, washed, and is then ready for purification. To the combined liquors an excess of alkali is added which throws

out the impure hydrastine, which after washing and drying is ready for purification. All liquors are rejected. The berberine salts are purified by repeated crystallizations from boiling water, and finally in alcohol. Fair samples of drug yield about 3½ per cent. The crude hydrastine is dissolved in boiling alcohol or chloroform, filtered and recrystallized. The yield is about 1¾ per cent.

Second Process.—The above quantity of crude drug may be macerated with a 2 per cent. solution of acetic acid, and this at first sight would seem the better process; practice, however, leads to an opposite deduction, as the quantities of liquid to be handled are greater and the troubles in purifying multiplied. However, the merits are dependent on machinery at hand as much as anything else.—Drug. Circ., Febr. 1897, 34.

Berberine—Purification and Characters.—According to Scholtz, methyl alcohol is the best solvent for the purification of berberine, the commercial base yielding colorless crystals, whilst with acetone or chloroform the product is amorphous and has a lower melting point than the crystals. These melt at 214° C., and have a composition corresponding with the formula $C_{18}H_{21}NO_8$, assigned to berberine by Bödeker and Flückiger. In the crystalline condition, berberine is very sparingly soluble in either methyl or ethyl-alcohol, even when boiling. The hydrochloride is also crystallizable, and it melts at 259°–260° C.—Pharm. Journ., Oct. 31, 1896, 377; from Berichte, xxix., 2054.

Chelidonine—Characters and Uses of Different Salts.—The phosphate and sulphate of chelidonine are colorless crystalline salts, easily soluble in water, whereas the tannate is an amorphous powder, soluble only in alcohol, but containing 53.5 per cent. of the pure alkaloid. These salts are said to have yielded excellent results in gastric ulcer, gastric carcinoma, and in enteralgia, in doses of 0.1 to 0.2 Gm. They possess the advantage over opium in these affections in not causing the slightest symptoms of constipation, drowsiness, or stupor, and their administration is not attended by any unpleasant after-effect whatever.—Pharm. Post, 1897, 148.

Taxine—Method of Extraction from Yew Leaves.—Vreven communicates the following method for extracting taxine from yew leaves: The fresh leaves, cut up small, are extracted with water acidulated with tartaric acid, evaporated on a water bath to a low bulk, mixed with sand to obtain a paste, and then exhausted with a mixture of equal volumes of water and alcohol in successive portions. This extract is filtered, evaporated, rendered alkaline with ammonia, and shaken out with benzene. The solvent separates fairly well from the emulsion formed by the ammonia on the addition of a little alcohol. The benzene extract is partially distilled, and, on cooling, throws down a trace of precipitate, apparently alkaloidal, but not taxine. This is filtered off and the taxine shaken out from the residual benzene with dilute hydrochloric acid. The acid solution gives with am-

monia a plentiful precipitate, which is taken up with ether. This solvent on evaporation leaves the impure taxine as a hard, yellowish, amorphous mass, giving a red coloration with sulphuric acid, a slight blue tint with nitric acid, passing to blue on touching with fuming hydrochloric acid. The alkaloid is further purified by re-solution with hydrochloric acid and precipitating with an excess of ammonia, being allowed to stand in contact with the alkali for twelve hours. The taxine subsides, leaving a greenish liquid, which is decanted and filtered.—Pharm. Journ., Sept. 5, 1896, 215; from Bull. Gén. de Thérap., i, 261.

Sparteïne—Oxidation Products.—It is of interest to ascertain the nature of the oxygen atoms which have entered during the process of oxidation whereby sparteïne is converted into *oxysparteïne* and *dioxysparteïne*, since the two products differ in their physiological action. Thus

Oxysparteïne ($C_{15}H_{24}N_2O$) produces an increase in the heart activity, while *Dioxysparteïne* ($C_{15}H_{26}N_2O$) has an inverse effect upon the heart. Felix B. Ahrens now shows that oxysparteïne contains an aldehyde group, while dioxysparteïne contains two hydroxyl groups.—Pharm. Rev., May, 1897, 93; from Berichte, *30*, 195.

Erythrophleine Hydrochloride—Character.—Erich Harnack, who had investigated the alkaloid of sassy bark—*Erythrophleium guineense*—some fifteen years ago, has now examined a specimen of the hydrochloride prepared by E. Merck, and finds that it differs considerably from that originally examined by him. The salt, as well as the platinum double salt, constitutes a fine, light-yellow, amorphous powder, while in the former investigation it could only be obtained in the form of a thick syrup. The substance produced in cold- as well as warm-blooded animals the digitalin action only, not the picrotoxin action, which was also characteristic of the former substance. It was, moreover, not hydrolized as readily as the former substance. These differences are probably due to the fact that the new material was derived from a different species of *Erythrophleum*, *E. Coumenga* being already mentioned by Gallois and Hardy (1876) as containing a similar base.—Archiv. Pharm., *234* (Nov., 1896), 561–570.

Pellotine—Preparation and Character.—Attention has already been directed to pellotine as a new hypnotic (see Proceedings 1896, 818). The process for its preparation from *Anhalonium Williamsi*, a cactus fairly common on the Mexican plateau, is as follows: The sliced cactus is repeatedly extracted with dilute ammoniacal alcohol, at a temperature of from 40 to 50° C. The yellowish-green extract is distilled until a residue of syrup consistency, which is acid, remains. Water is added and the solution is evaporated to remove traces of the alcohol. Considerable resin, which is insoluble in both acids and alkali, separates. This is removed by filtration. The clear, brown-colored filtrate is made alkaline with ammonia and repeatedly shaken with large quantities of ether. The ether is

recovered by distillation. The residue, though without a specific odor, possesses a strong alkaline reaction. The attempt to purify the pellotine through the sulphate was unsuccessful. If the alkaline syrupy residue is diluted with 96 per cent. alcohol and set aside in a desiccator, a considerable quantity of crystals separate within 12 to 24 hours. These are purified by recrystallization from alcohol and lastly from petroleum ether. Pellotine is a tertiary base, the composition of which is expressed by the formula $C_{13}H_{19}NO_3$. It crystallizes from alcohol in colorless plates, which melt at 110–111°, possess a bitter taste, are difficultly soluble in water, readily in alcohol, ether, acetone and chloroform. As has been demonstrated, pellotine contains two methoxy groups (OCH_3), whereas the third oxygen atom is present in the form of a hydroxy group, the hydrogen of which can be replaced by methyl, benzoyl, etc., radicals. With acids, pellotine combines to form readily crystallizable salts. Of these the hydrochloride can most readily be obtained in a pure form and is, therefore, best adapted to therapeutic experiments. It crystallizes in colorless prisms, which are readily soluble even in cold water. Alcohol dissolves only traces. From the dilute aqueous solution ammonia gradually precipitates the free base, whereas potassa and soda do not.

The cactus is known as "pellote," and, like coca, is chewed to overcome hunger, thirst and fatigue during races and long marches. The juice is intensely bitter, and contains from 0.75 to 0.89 per cent. of pellotine.—Pharm. Review, July 1896, 153.

Stachydrine—Occurrence in the Leaves of Citrus vulgaris.—According to E. Jahns the leaves contain, in addition to volatile oil, bitter substances, etc., several bases, among which is one that proved to be identical with stachydrine, obtained by Planta and Schulze, from the tubers of *Stachys tuberifera.*—Pharm. Jour., Oct. 31, 1896, 378: from Berichte, xxix., 2065.

Arginine—Occurrence in Various Plants.—Schulze has found arginine, $C_6H_{14}N_4O_2$, to occur in the tubers and roots of *Brassica rapa, Helianthus tuberosus, Ptelea trifoliata,* etc. The base was originally obtained by Hodin as one of the products resulting from the action of hydrochloric acid upon protein substances, and it was subsequently detected in the blanched sprouts of *Lupinus luteus.*—Pharm. Jour., Oct. 31, 1896, 378; from Berichte, xxix., 352.

Carpaine—Alkaloid from Carica Papaya.—Van Rïjn states that the Indians extract the bitter substance from the leaves of *Carica papaya* by boiling them, mixing the mass with a certain kind of clay, again boiling, and filtering. This substance is an alkaloid, carpaine, which is said to act as a febrifuge when quinine is non-effective. It possesses, however, a very strong action on the heart. He has prepared the pure alkaloid and finds it to have a composition corresponding to the formula $C_{14}H_{25}NO_2$. The hydrochloride, nitrate, picrate, and other salts, have been obtained

in crystalline form.—Pharm. Jour., May 29, 1897, 466; from Ned. Tijd. voor Pharm., ix.

Ricinine—Preparation from Castor Oil Seeds, Characters, etc.—Marco Soave has prepared and describes the poisonous principle of castor oil seeds, ricinine, which is yielded by the pressed seeds to the amount of 0.3 per cent., and by the husks to the amount of 1.5 per cent. The pressed seeds or husks are extracted with boiling water, the extract evaporated on the water-bath, and the residue treated with alcohol. The alcoholic solution is then evaporated to dryness and the residue treated with caustic soda; by this means, the impurities are dissolved out, and the ricinine which remains behind may be crystallized from alcohol or water. It crystallizes in glistening plates, melts at 194°, has a bitter taste, is readily soluble in water, alcohol, chloroform, benzene, and ether; the aqueous solution is neutral and optically inactive. Ricinine may be sublimed when carefully heated; it is soluble in concentrated sulphuric acid, yielding a colorless solution, which becomes straw-yellow, and then bright scarlet red, on warming. The colorless sulphuric acid solution gives, with a crystal of potassium dichromate, a bright green coloration; the author suggests this as a test for ricinine. Ricinine does not give the usual tests for alkaloids, neither does it form salts with strong mineral acids. It has a composition corresponding to the formula $C_{17}H_{18}N_4O_4$, and yields a bromo derivative, $C_{17}H_{16}Br_2N_4O_4$, which melts at 247°, and a corresponding chloro derivative, which melts at 240°. With mercuric chloride, it yields the compound $C_{17}H_{18}N_4O_4 \cdot 3HgCl_2$, which melts at 204°. When oxidized, it yields a new acid, $C_{15}H_{14}N_4O_4$, which the author terms

Ricinic Acid.—This acid may also be obtained by the hydrolysis of ricinine with caustic soda. It is a dibasic acid, which melts at 295°, yields a silver salt, a barium salt crystallizing with $4H_2O$, and a bromo derivative, $C_{15}H_{12}Br_2N_4O_4$, melting at 180°.—Pharm. Rev., Aug., 1896, 186; from An. Chim. Farm., 21, 49.

Sangoline.—A new alkaloid from the root of *Cocculus leæba*, known as *Sangol*, which see under "Materia Medica."

Creatinine—Identity as Obtained from Different Sources.—Toppelius and Pommerehne have investigated the question raised by Johnson whether there may not be several different kinds of creatinine, and conclude from their results that there is no difference between the creatinine from flesh, from urine, and synthetic creatinine. Their picrates, platinum and gold salts had practically the same melting points and solubilities, and there was so little difference in the reducing action of the creatinines from different sources, as to warrant the conclusion that they were identical. The hydrochloride of creatinine extracted from urine, while not anhydrous when simply crystallized from watery solutions, was anhydrous, like the salts from other sources, when crystallized from solutions containing hydro-

chloric acid in excess. The distinction drawn by Johnson between "efflorescent" and "tabular" crystals of creatinine, is entirely due to the conditions under which crystallization is effected, the one form being convertible into the other.—Arch. d. Pharm., ccxxxiv., 380.

Synthetic Remedies—Color Tests.—Frank X. Moerk has observed that the saturated solutions of *phenacetin*, *methacetin*, *lactophenin*, and a 1 per cent. solution of *phenocoll hydrochlorate*, mixed with sufficient bromine water to give a pale-yellow color, will in a short time become colorless, then pink-red, and finally brown. The addition of alkalies or their carbonates deepens the pink or red color. *Lactophenine* deposits a white powder; the other solutions remain clear, unless they are stirred, when a turbidity may be noticed. If solutions of these several substances are thoroughly agitated with an equal volume of bromin water and then with half a volume of petroleum benzin, the *phenocoll hydrochlorate* will speedily develop in the aqueous solution a pale-red or violet color, changing to a "crushed raspberry or strawberry," while the other aqueous solutions become yellow or brown. If 0.010 Gm. *salophen* be boiled for a minute or two with 5 Cc. solution of potassa (5 per cent.), and then agitated so as to mix the solution with atmospheric oxygen, a green color will develop, changing to yellow, red, or violet on standing, but again restored to a green or developing a blue color on agitation. Solutions of the other remedies mentioned remain colorless under the conditions of this test. By boiling 0.010 Gm. of the substance for a minute or two with 5 Cc. of solution of potassa, adding a minute fragment of potassium permanganate, and again boiling, *salophen* yields a blue greenish coloration, while *phenacetin*, *methacetin*, *phenocoll*, *lactophenin*, *acetanilid* and *exalgin* produce yellow, slighly acidulated solutions.—Proc. Penna. Pharm. Assoc., 1896, 71.

Acetanilid—Ready Method of Detection in Phenacetin or Antipyrine.—Donald Cameron recommends a method for the detection of acetanilid in admixture with phenacetin or antipyrine, which is based upon the slight solubility of acetanilid and phenacetin in water, the ready solubility of antipyrine in that solvent, and the insolubility of phenacetin in chloroform, in which acetanilid is soluble. The substance is therefore first shaken with water, which dissolves the antipyrine, for which suitable tests are made. The residue is shaken with chloroform, which dissolves the acetanilid and leaves the phenacetin undissolved. Their identity is then established by the usual tests.—Proc. N. J. Phar. Assoc., 1896, 47–49.

Acetanilid—Detection in Allied Synthetic Remedies.—F. X. Mœrk, after reviewing different tests that have been proposed for the detection of acetanilid in allied synthetic remedies, decides in favor of the

Iso-nitril Test, which depends upon the formation of phenylisocyanide, C_6H_5NC, and the recognition of this by its peculiar and offensive odor. Since, however, all of the synthetic compounds in which acetanilid might

be suspected give rise to odorous products under the original conditions of the test—heating of the substance with solution of soda or potassa, and a few drops of chloroform or chloral hydrate—the author experimented with the view to destroying these odorous compounds without affecting that produced from acetanilid. For this purpose the use of potassium permanganate suggested itself, and was found to answer admirably in the case of the following synthetic compounds:

Methacetin, Phenacetin, Lactophenin, Salophen and Phenocoll Hydrochlorate.—It does not, however, answer in the case of *Exalgin*, in which it undoubtedly caused the formation of phenyl isocyanide instead of improving the test. This is considered as follows: 0.1 Gm. of the suspected substance is boiled with 10 Cc. of water, in which all of the above-mentioned synthetic compounds with the exception of salophen are soluble; then cool quickly by immersion in cold water and filter through cotton. To 2 or 3 Cc. of the filtrate add an equal volume of 5 per cent. solution of potassa (or soda), boil, and add small fragments of potassium permanganate until the green color first produced gives way to a violet or purple after boiling; then add two or three drops of a mixture of chloroform, 10 Cc., alcohol, 10 Cc., and water of ammonia, 0.5 Cc.; boil, and again add some of this mixture if the permanganate has not been completely reduced to brown manganic hydrate. Then, after the chloroform has vaporized by standing a few moments, note the odor and compare it, if doubtful, with that yielded by a dilute acetanilid solution treated in the same manner. In testing *Exalgin* omit the potassium permanganate, making the test otherwise in the same manner. The test is a delicate one, acetanilid being recognized in solution containing 1 : 200,000. Proc. Penn. Pharm. Assoc., 1895, 67–70.

Acetanilid—Fallacy of Test in Presence of Volatile Oil.—Prof. E. L. Patch observes that tablets containing acetanilid and terpene oils (such as oil of lemon, oil of orange, etc.) fail to respond to the official iso-nitril (phenyl isocyanide) test unless first powdered and heated to expel the oils. The presence of the latter hinders the reaction.—Merck's Report, Aug. 15, 1896, 403.

Eucaine—Synthetic Production.—As an illustration of the way in which chemical structure may serve as a guide in the attempt to produce artificially a substance of particular physiological action, the circumstances connected with the production of eucaine, as narrated by G. Merling in a communication to the German Pharmaceutical Society, are extremely instructive: In 1886 Emil Fischer showed that when methyl-triacetonalkamine reacts with mandelic acid, so that the hydrogen of its hydroxyl is replaced by the mandelic radical, a substance is produced which has marked mydriatic properties, like atropine and homatropine. This mydriatic character of the compound obtained seemed in so far remarkable,

that there did not appear to be any close chemical relation between methyl-triaceton-alkamine and tropine; but the intimacy of the relation between these compounds became evident, when both of these were shown to be derivatives of γ-oxy-methylpiperidine as represented by their formula.

Between atropine and cocaine there is a similar close relation. Ecgonine may be regarded as the carboxylic acid of tropine, and, therefore, a derivative of a γ-oxy-piperidine-carboxylic acid. It can be converted into cocaine by replacing the carboxyl hydrogen by methyl, and the hydroxyl hydrogen by benzoyl. Having regard to the analogy between amygdal-methyl-triaceton alkamine and atropine or homatropine, the idea suggested itself that by effecting a similar introduction of benzoyl and methyl into the γ-oxy-piperidine-carboxylic acid compounds obtainable by synthesis, products might be obtained which would resemble cocaine in possessing the power of producing local anæsthesia. Such synthetic compounds were at the time unknown, but Merling found that they could be prepared by attaching hydrocyanic acid to triacetonamine or some one of its analogues—vinyldiacetonamine, benzaldiacetonamine, etc. The synthetic γ-oxy-piperidine-carboxylic acids thus produced are analogues of ecgonine and—in the same way that ecgonine is converted into cocaine by successive esterification and benzoylating—they are converted into basic products, which possess, in common with cocaine, the property of producing local anæsthesia.

Eucaine belongs to this class of compounds. It is the methyl ester of a methyl-benzoyl-triaceton-alkamine-carboxylic acid. It crystallizes from ether or alcohol in brilliant prisms melting at 104° C. The hydrochloride dissolves in ten parts of water; when crystallized from methyl-alcohol it contains two molecules of water, while when crystallized from water it contains only one molecule.—Pharm. Journ., Oct. 17, 1896, 337; from Ber. d. deutsch. pharm. Ges., vi, 173.

Eucaine A—Preparation and Characters.—To distinguish the older eucaine from the *Eucaine B* (which see) it is now designated as *Eucaine A*, and is said to be prepared as follows: Hydrocyanic acid is added to triacetonamine, a condensation product of acetone and ammonia, and the cyanhydrin is hydrolized. In the resulting acid the hydroxyl hydrogen is replaced by a benzoyl group, and the carboxyl hydrogen and imide hydrogen are replaced by methyl. The free base is sparingly soluble in water, readily soluble in alcohol, ether, chloroform, and benzene, and forms neutral salts with acids. The large crystals obtained from ethereal solutions melt at 104°–105°.

Hydrochloride of Eucaine A, $C_{19}H_{27}NO_4.HCl.H_2O$, crystallizes from water in scales or tablets, and is soluble in water to the extent of 9 to 9.5 per cent. The solution can be boiled without decomposition. It is compatible with *antiseptics*—such as phenol, tricresol, guaiacol, naphthol, resorcinol, salol, ichthyol, formalin, iodoform; with *hydrocarbons*—such as

ligroin, petroleum, vaseline, benzene, toluene; with *fats and oils;* with *volatile oils;* with *alcohols* and *esters;* with *alkaloids*, and with *alkaloid-like substances*, such as antipyrine, phenacetin, etc.—Pharm. Rev., June, 1897, 118; from Pharm. Centralh., *38*, 281.

Eucaïne B.—Characters, etc.—According to P. Silex, *Eucaïne B.* is the hydrochloride of benzoylvinyldiacetonalkamine. It stands in close relation to the older eucaïne, or eucaïne A, and also to cocaine and tropacocaine. This hydrochloride, in distinction to the corresponding salt of cocaine, can be boiled indefinitely, without decomposition, and consequently its solutions can be sterilized. A 5 per cent. aqueous solution can be prepared at ordinary temperature, such solution being neutral or but slightly alkaline. Unlike eucaïne A, it exerts but little, if any, irritation upon ocular membranes, and it is stated to be as good an anæsthetic and less poisonous than the older eucaïne.—Pharm. Rev., April, 1897, 77; from D. Med. Wochenschr., 1897,6 .

Holocaine—A New Local Anæsthetic.—According to Dr. Tauber, holocaine, a new local anæsthetic, is formed by combining molecular quantities of phenacetin and p.-phenetidin, being chemically *p.-diethoxyethenyl-diphenylamidine.* It is a strong base, insoluble in water, forming beautiful crystals which melt at 120°. It forms crystalline salts, which are with difficulty soluble in cold water. The hydrochloride, which forms white needles, is readily soluble in boiling water. Its aqueous solution is slightly bitter, neutral, and not changed by boiling. It may be made of 1 per cent. strength, and this has been kept for months without signs of decomposition. Dr. G. Gutman recommends it as a substitute for cocaine in ocular surgery.—Pharm. Ztg., 1897, 192, and D. Med. Wochenschr., 1897, 11.

Hydroxylamine Sulphate—Economical Preparation.—Edward Divers and Tamemasa Haga, of the Imperial University, Japan, communicate the following economical process for the preparation of hydroxylamine sulphate: A concentrated solution of 2 mols. of the commercial sodium nitrite (of 95 per cent. purity) and of 1 mol. of sodium carbonate, pretty closely adjusted in their proportions, is treated with sulphur dioxide till just acid, while it is kept well agitated at 2°–3° below zero by immersion in ice and brine, apparently perfect conversion of the nitrate into oximidosulphonate resulting under these conditions. Upon gently warming with a few drops of sulphuric acid, the oximidosulphonate rapidly hydrolyzes, with marked rise of temperature, into oxyamidosulphonate and acid sulphate. The solution of these salts is kept at 90°–95° for two days, by the end of which time all oxyamidosulphonate will have hydrolyzed into hydroxylamine sulphate and acid sodium sulphate, while so small a quantity of ammonium salt is produced that it can only be detected in the very last mother liquors. The hydrolysis can be hastened by higher temperatures, but only with disastrous results, whilst at lower temperatures the

process requires a correspondingly longer time. Sulphonation complete, which may be determined by adding excess of barium chloride to a little of the solution, filtering, and boiling filtrate with potassium chlorate, which changes any sulphonate into sulphate—the solution is neutralized with sodium carbonate, using methyl orange as indicator, evaporated to 10.5 or 11 times the weight of nitrite employed, and left to cool at 0° or lower, when nearly all the sodium sulphate will crystallize out. Upon then evaporating the solution separated, much of the hydroxylamine sulphate will crystallize out upon cooling to the *ordinary* temperature. A little more sodium sulphate will crystallize out if the mother liquor is slightly diluted and cooled to 0° again, and the liquor will then yield hydroxylamine sulphate when worked as before. The yield of crude hydroxylamine sulphate is then about 9 parts from 10 parts nitrite taken; an additional 1 part may be separated from the sodium sulphate obtained, and it appears quite possible that on a large scale the theoretical yield, 118.84 per cent. may be obtained. The crude hydroxylamine sulphate is easily purified by recrystallization, and the mother liquors may be worked up closely; it readily forms large, non-deliquescent crystals, which are soluble in three-quarters of their weight of water at 20°.—Chem. News., April 15, 1897, 181.

Quinacetine—A New Antipyretic Base.—The sulphate of a new base, quinacetine, has been recently recommended as an antipyretic and antiperiodic, and is claimed to exert a specific influence in malarial attacks. Quinacetine has the composition $C_{27}H_{31}N_3O_2$, and forms three series of salts, with acids analogous to those of the alkaloid quinine, possessing similar properties of solubility. It is obtained by the reaction between certain organic groups in combination and methoxylated ditetrahydro-chinolyl, and occurs as an amorphous white powder quite free from taste and odor; is insoluble in water, sparingly soluble in ether, more so in chloroform and benzene. The new antipyretic,

Quinacetine sulphate, has the composition $(C_{27}H_{31}N_3O_2)_2H_2SO_4.H_2O$. It separates from a partly saturated boiling aqueous solution on cooling, in beautiful fungoid tufts consisting of snow-white crystals radiating from a center. When carefully dried upon bibulous paper the sulphate of quinacetine presents itself in the form of fine lustreless snow-white needles adhering in tufts; has an elastic velvety feel, and is easily reduced to a soft powder between the fingers. It dissolves readily in all acid solutions, forming freely soluble bi-salts, which, like the sulphate, are incompatible with all metals, metallic hydrates and the carbonates. It may be given in doses of from 5 to 15 Gms. Its calming influence upon the system and its power to allay nervous excitability would seem to indicate its usefulness in those particular cases of disease where high inflammatory symptoms and restlessness supervene.—Pharm. Era, Oct., 1896, 527.

Notropinon.—This, according to R. Willstaller, is a ketone obtained by

the further oxidation of "tropigenin," an oxidation product of tropin. The oxidation is effected with chromic acid in solution with glacial acetic acid at 55° to 65°. Notropinon is described as a solid, melting at 69° to 70°, and absorbing carbon dioxide and water with avidity. It is recommended for medicinal purposes in form of saline compounds as well as in the form of alkyl and acetyl derivatives.—Ztschr. Oest. Apoth. Ver., Jan. 10, 1897, 29.

Vanillin-Paraphenetidin—A New Condensation Product.—By a patented process of C. Goldschmidt, a new condensation product—vanillin-paraphenetidin—is formed by heating vanillin with paraphenetidin at a temperature of about 140° C., and pouring the product of the reaction into diluted hydrochloric acid, whereby the new compound is precipitated as a yellow powder. It crystallizes from hot water with 3 molecules of water, and melts at 97° C. It is but slightly poisonous, and differs from the analogous bodies so far known, the compounds formed between paraphenetidin and other aldehydes, besides in its solubility in water, by its possessing also hypnotic as well as antineuralgic properties.—Phar. Ztg., 1897, 248.

Kyrofin—A New Antipyretic.—Dr. Herman Eichhorst calls attention to a new antipyretic, *kyrofin*, which he has found to be beneficially active in the fever of phthisis, in streptococcus, diphtheria, in tubercular meningitis, and in ulcerated endocarditis. It is administered in cachets in doses of 0.5 Gm. thrice daily, being equivalent in effect to 1 Gm. doses of phenacetin. The new antipyretic is a condensation product of paraphenetidin and methyl-glycolic acid, prepared by heating these bodies at a temperature of 120° to 130° C., and it is, chemically, "methyl-glycolic-acid-phenetidid." It crystallizes from water in the form of white, odorless crystals, melting at between 98° and 99° C., sparingly soluble in water (1 :600 cold or 1 :52 boiling), and having in concentrated solutions a bitter and pungent taste. It is said to have advantages over many of the antipyretics in common use—such as phenacetin, antipyrine, exalgin, etc. —Merck's Rep., June 1, 1897, 343; from D. Med. Wochenschr, xxiii, 257.

Malarin—A New Antipyretic.—Under the name of "Malarin," a new antipyretic is described as being the citrate of a condensation product of acetophenone and paraphenetidin. It is insoluble in cold water, has a slightly acidulous taste, and is given in doses of five grammes with safety, being useful in cases of neuralgia. The condensation product,

Acetophenone-phenetidid, is prepared by heating equivalent proportions of acetophenone and p-phenetidin either alone or with dehydrating agents. It crystallizes in yellow needles, melts at 88° C., and is readily soluble in hot alcohol, ether, or glacial acetic acid.—Pharm. Zeit., 1896, 598.

Phenylchinoldine—A New Remedy for Malarial Fever.—A writer in

"Pharm. Reform," recommends phenylchinoldine—$C_3H_8(C_6H_5N)$ as a remedy for malarial fever, in doses of 10 to 20 centigrams. It is obtained by the action of hydrochloric acid on a mixture of aniline, acetophenone and aldehyde. The chlorhydrate of the base occurs in colorless crystals, which are readily soluble.—Bull. Comm., xxiv., 273.

Imidiod—A New Antiseptic.—By heating para-ethyoxyphenylsuccimide, potassium iodide, and iodine, in diluted acetic acid, a new antiseptic compound is formed which has been named "imidiod." It is described as lustrous, rhombic crystals that melt at 175° C., and are black by reflected, red by transmitted, light. It is said to be non-poisonous, and to have valuable antiseptic properties. It may, in some cases, advantageously replace iodoform in the treatment of wounds, ulcers, etc., by reason of the slow liberation of iodine from it.—Merck's Report, Sept. 1, 1896, 454.

Argentol—A New Antiseptic.—A compound of silver with oxyquinoline has been introduced under the name of argentol as an antiseptic which is intended to replace silver lactate and citrate, over which it possesses the advantage of being less stable, easily breaking up in the presence of septic matter into strongly antiseptic oxyquinoline and metallic silver. It is said to have the composition $C_9H_5N.OH.SO_3Ag$, and constitutes a non-irritating, non-poisonous powder, which is with difficulty soluble, and is especially adapted to replace iodoform as well as silver preparations, which separate out silver oxide on decomposition. It can be applied as dusting powder, made up into ointments, or used as injection in form of emulsion for gonorrhœa.—Pharm. Ztg., 1897, 174.

Hydrargyroseptol—A New Antiseptic.—A combination of quinosol mercury with sodium chloride—$C_9H_5N.O.SO_3Hg + 2NaCl$—has been introduced as a new antiseptic under the name of "Hydrargyroseptol." It dissolves in water, forming a slimy, odorless mass, not unlike yolk of egg in appearance.—Pharm. Ztg., 1897, 174.

Cosaprin—A New Antipyretic.—Under the name of "Cosaprin," an acetyl compound of sodium sulphanilate has been introduced that is designed to replace acetanilid, over which it is said to possess many advantages, among these being absence of cyanosis on administration and ready solubility in water. The difference in structure between acetanilid, sodium sulphanilate, and cosaprin, is shown by the following formulas:

$$C_6H_5.NH(CO.CH_3) \qquad C_6H_4\begin{cases} NH_2 & (1) \\ SO_3Na & (4) \end{cases}$$

[Acetanilid] [Sodium Sulphanilate]

$$C_6H_4\begin{cases} NH(CO.CH_3) & (1) \\ SO_3Na & (4) \end{cases}$$

[Cosaprin]

Cosaprin occurs as a white, crystalline mass or crystals, very readily soluble in water, difficultly so in alcohol, and almost entirely insoluble in

ether. By continued boiling with acids, it decomposes on cooling into sulphanilic acid, with the formation of acetic acid; the presence of alcohol determines the formation of acetic ether.—Merck's Rep., April 1, 1897, 212; from Pharm. Post, Feb. 28, 1897, 113.

Saliformin—Characters, etc.—The name "saliformin" has been given to formin salicylate (hexamethylenetetramine). It is a white, crystalline powder, easily soluble in water and in alcohol, and possesses a pleasant acidulous taste. It is reported to be a powerful uric acid solvent and to have antiseptic properties. The daily dose is from 1 to 2 grammes.—Merck's Rep., Mar. 1, 1897, 145.

Lithio-piperazine—A New Diuretic Combination.—Under the name "lithio-piperazine," a compound of lithia and piperazine—proportional composition not given—is now marketed by a German manufacturing firm. It occurs in form of a white, granular, easily soluble powder, and in tablets of 1 gramme each.—Zeitschr. Oest. Apoth. Ver., July 20, 1896, 552.

Collidine and Lutidine—Two New Tar Bases.—F. Ahrens describes two new bases obtained from tar, which he has named *collidine* and *lutidine*, respectively.

Collidine, $C_8H_{11}N$, is an oily body, but slightly soluble in water, of an aromatic odor, and boiling at 165°–168° C. Its picrate, $C_8H_{11}N.C_6H_2(OH)(NO_2)_3$, forms long, orange-colored needles, melting at 128–131° C.; upon oxidation it yields pyridinetricarbonic acid, $C_5H_2N(COOH)_3$.

Lutidine, C_7H_9N, is also an oily liquid, difficultly soluble in water, and boiling at 163.5° C.; the hydrochlorate is obtained as hygroscopic needles upon precipitating its alcoholic solution with ether. Oxidation converts lutidine into cinchomeronic acid.—Merck's Rep., June 1, 1897, 343; from Pharm. Post, 1897, 209.

Methylene Blue.—Characteristic reaction with *Picric acid*, which see under "Organic Acids."

Methylene Blue—Value as a Remedy in Headache.—Dr. Benno Lewy has successfully treated cases of migrain, purely nervous headache and neurasthenia, with methylene blue, giving it in doses of 0.1 Gm. with an equal quantity of powdered nutmegs, in capsules, 4 times a day until ten doses, if necessary. Four doses, however, usually sufficed. Beyond the coloration of the urine, lasting 8 to 10 days, no other inconvenience follows the use of this medicament.—Merck's Rep., Dec. 15, 1896, 665; from Wien. Med. Presse., xxxvii., 1451.

Methylene Blue—Efficiency in the Treatment of Malaria.—Dr. Roettger has administered methylene blue in cases of malaria, in doses of 10 centigrammes, in capsules, six or eight times a day, with the best results. The treatment extended over a period of from eight to thirty-three days, the patient being restored to normal health, without a single relapse. With

the exception of a slight nausea at first, in some cases, no bad effects were observed.—Nouv. Rem. xii., 399; from Deutsch. Med. Wochenschr.

Methyl-Guanidine.—Preparation from, and use as a reaction for creatinine in urine. See "Urine."

Pyoctannin-Mercury—Preparation.—The following method for preparing pyoctannin-mercury is given in "Zeitschr. Oest. Apoth. Ver." (July 10, 1896, 534): An aqueous solution of mercuric chloride, prepared by the aid of ammonium chloride, is added to a concentrated aqueous solution of *blue* pyoctannin. The resultant precipitate of mercuric pyoctannin is not colored as intensely as is pyoctannin, from which it also differs in its solubilities, while it contains about 55 per cent. Hg. In the form of ½ to 1 per cent. solution it has been found efficient for the treatment of chronic gonorrhœa and favus. It has been found useful also as a substitute for iodoform, and, mixed with an equal quantity of starch, it has been used with good effect in the treatment of burns. See also *Pyoctannin-Mercury Gauze*, under "Pharmacy."

Naphthol Yellow, S., etc.—Recognition in *Wines*, which see under "Materia Medica."

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Saponin—Use as an Emulsifier.—See *Saponin Emulsions*, under "Pharmacy."

Marrubiin—Characters, Composition and Dichlorine Derivative.—Harry Matusow, after a brief resumé of the investigations that have hitherto been made upon the crystallizable principle obtained from *Marrubium vulgare*, gives the results of his own studies and investigations. Operating upon the herb collected by himself during the months of July, August and September, and carefully dried, he obtained the best yield with the smallest quantity of extraneous matter by resorting to acetone for its extraction; the other solvents tried being alcohol and benzene. He describes the process circumstantially, by which he obtained the marrubiin in a pure condition, and finds it to have the following characters: It crystallizes from hot alcohol when not concentrated, in lustrous, colorless needles arranged in star-shaped groups, but from concentrated hot alcoholic solution in dull white plates; melts after successive recrystallization and treatment with animal charcoal at 154°–155° C.; is soluble in acetone, ether, alcohol and chloroform, but most readily in hot benzene; and is insoluble in petroleum benzin and cold water, hot water dissolving it only sparingly. It is not a glucoside and is devoid of nitrogen, and when subjected to combustion gives figures which lead to the formula $C_{30}H_{43}O_6$.

The author's results confirm Kromayer's in general, excepting the melting point, which he determined to be 160° C. The melting point differs also from that given by Harms (= 148° C.), but approaches nearest to

that obtained by Morrison, from whom his results differ, however, in the formula, and in the fact that marrubiin is not a glucoside. The author, by a method described, obtained a dichlorine derivative of marrubiin, the analysis of which leads to the formula $C_{30}H_{41}Cl_2O_6$.

Marrubiin Dichloride is a yellowish-white, hard, wax-like substance, soluble in ether and alcohol, from which solvents, however, it could not be obtained in crystalline form, even after repeated attempts at crystallization. When heated it becomes transparent at 63° C.—Amer. Jour. Phar., April, 1897, 201–209.

Cascarillin—Comparative Experiments with the Products of Alessandri and Duval.—W. A. H. Naylor and R. D. Littlefield review the characters assigned to cascarillin by M. Duval (1845) and by Dr. P. E. Allesandri (1882), the processes for its preparation employed by them, as well as the simple process of C. and E. Mylius (1873), with the two-fold object of determining: 1, whether Allesandri's principle is chiefly cascarillin, or a base contaminated with sufficient cascarillin to give the characteristic color reactions described by Duval, and 2, how far cascarillin, isolated by either Allesandri's or Duval's method, and purified, corresponds in composition with the formula assigned to it by C. and E. Mylius. For these purposes the author prepared a quantity of cascarillin by both methods, adopting that of Allesandri without modification, while in working by Duval's method evaporation was in part conducted in vacuo. As a result of their inquiry, they find, in the first place, that when the cascarillins obtained by either method were completely purified by repeated crystallizations from alcohol until the product had a constant melting point, they were absolutely identical. The melting point proved in both cases to be 203.5° C., and both products corresponded to the characters and tests given by Duval, and negatived those reactions given by Allesandri, and in conflict with Duval's, that depend upon the presence of a nitrogenous and alkaloidal substance. The inference drawn by the authors from these results is to the effect that Allesandri's process yields a mixed product, from which pure cascarillin is obtained after much labor and considerable waste of material. On the other hand, Allesandri's process, in so far as his impure cascarillin is concerned, is far more speedy than that demanded by Duval's oft-repeated operations.

Concerning the composition of cascarillin the authors obtained figures showing about 1 per cent. more carbon than those of Mylius, who assigned to it the formula $C_{12}H_{18}O_4$, while their figures agree with the formula $C_{16}H_{24}O_5$. It must be noted, however, that the melting point of the cascarillin of Mylius was 205° C., while that of the pure cascarillin of the authors is 203.5° C. A further interesting observation made by them is, that when heated with zinc dust, cascarillin gives a distillate allied to anthracene.—Yearbook of Pharm., 1896, 301–305.

Digitoxin—Characters and Relation to Other Digitalis Principles.—In a former paper (see Proceedings 1896, 825) H. Kiliani had obtained from digitalis leaves a handsomely crystallized glucoside, which he believed to be identical with Schmiedeberg's digitoxin, but to which he had given the provisional name of β-digitoxin until the identity of the two substances could be positively established. Further experiments have now shown that the two substances are absolutely identical, and the prefixes α and β are, therefore, no longer necessary. Digitoxin may be readily extracted from the extract of digitalis leaves by means of ether. It is split, upon heating with alcoholic solution of hydrochloric acid, into

Digitoxigenin and a glucose, *Digitoxose.* The digitoxigenin is obtained in characteristic, colorless crystals; begins to melt at 225° and melts completely at 230°, but assumes a yellow color. Analysis of digitoxigenin leads to the formula $C_{22}H_{32}O_4$, that of digitoxose being $C_9H_{18}O_6$, and that of digitoxin $C_{31}H_{50}O_{10}$. The latter formula is that given by Arnaud to his "Digitaline crystallisée," melting at 243°–245°, and therefore in all probability identical with digitoxin. While digitoxin appears to be an abundant constituent of digitalis leaves, it has not been found in the seeds, which contain instead relatively large quantities of *digitogenin.*—Arch. d. Pharm., 234, No. 7 (Sept. 10, 1896), 481–489.

Strophanthin—Physiological Activity.—Drs. Horatio C. Wood and William S. Carter record the results of some physiological experiments made upon dogs to determine the relative value of an extract of strophanthus, prepared by evaporating the official tincture, and of strophanthin supplied by reliable manufacturers. They conclude that, as has been pointed out as early as 1888, by Rothziegel and Koralzewski, commercial strophanthin put upon the market by manufacturers of the first class is an extremely active substance; that it is superior to the extract prepared from the tincture, having a much more marked effect in raising the arterial pressure, and that it is a good substitute for the official tincture of strophanthus. They believe, therefore, that the Pharmacopœia should recognize the active principle of strophanthus, and give appropriate tests for its purity.—Amer. Jour. Pharm, July, 1896, 353–358.

A New Cardiac Glucoside has been isolated by Prof. Plugge, from the bark of *Lunasia amara*, which see under "Materia Medica."

Periplocin—A Cardiac Glucoside from Periploca Græca.—Lehmann and Burschinsky have isolated from *Periploca græca* a crystalline glucoside, periplocin, which has the composition $C_{30}H_{48}O_{12}$. It melts at 205, is readily soluble in cold water and in alcohol, with difficulty in ether. It is a powerful heart-poison, possessing great similarity in this respect to digitalin, strophanthin, ouabaïn, and deserves to be examined as to its medicinal value.—Pharm. Rev., May, 1897, 92; from Ztschr. Oest. Apoth. Ver., 1897.

Picrotoxin—Question of Unity.—It has been a problem in controversy whether picrotoxin, the active principle of *Anamirta Cocculus*, is a chemical unit or a mixture of several substances. It has been shown by several authors that the picrotoxin of commerce is no simple substance, but a mixture, and that from this a pure picrotoxin, melting at 199° to 200°, can be obtained. This pure picrotoxin can, however, be resolved by prolonged boiling with benzene or chloroform into picrotoxinin and picrotin, on which account it is by some regarded to be a mixture, while E. Schmidt regards it to be a single substance, having the formula $C_{30}H_{34}O_{13}$. R. J. Meyer now finds that the molecular weight of picrotoxin is but one-third of what it ought to be, if Schmidt's formula is taken to be correct. He also obtains according to different methods, only 3.4 per cent. of picrotin, and obtains picrotoxin synthetically from hot solutions of two molecules of picrotoxinin and one molecole of picrotin. He is engaged in the further study and separation of these two compounds, and expects to report more fully upon them, as also several of their derivatives, in a future paper.—Pharm. Rev., May, 1897, 93; from Ber. d. Pharm. Gen., 7, 16.

Pyrethrin—Preparation of the Pure Substance, Characters, etc.—Dr. Schneegans, referring to the results of previous investigations upon the acrid principle contained in the root of *Anacyclus Pyrethrum*, states that the preparations described by Buchheim in 1876 and by C. J. S. Thompson in 1887, under the name of pyrethrin, were simply more or less purified extracts, consisting, however, largely of this body. He has now succeeded in preparing pure pyrethrin as follows: The concised root is boiled several times with alcohol, the united extractions are concentrated, and the residual thick extract is dissolved in absolute alcohol, which leaves a large quantity of a grey, tasteless resin undissolved. After treatment with lead acetate and evaporation, a red-yellow syrupy liquid results, which is evaporated with milk of lime and sand to dryness, powdered, and extracted with petroleum ether. Upon evaporation of the light-yellow solution so obtained, a syrupy fluid results, which when kept in a vacuum over sulphuric acid congeals to a crystalline magma. By prolonged reaction and washing with little ether, the crystals may be separated from the oil with which they are associated, and are so finally obtained in a colorless and pure condition. Pyrethrin, viewed under the lens, appears as long, branched needles, united to form tufts. It melts at 46°, has an extremely burning taste, and is soluble in absolute alcohol, acetone, ether, concentrated acetic acid, chloroform and carbon disulphide. It is soluble in concentrated sulphuric acid, producing a yellow solution which soon changes to red.—Chem. Ztg., 1896, No. 84, 846.

Vanillin—Synthetic Production.—C. Gussman has obtained vanillin by boiling vanillo-carbonic acid, 1 part, with aniline, 2 parts, until the escape of carbon dioxide ceased. The substituted benzylidene-aniline formed was separated from excess of aniline by means of a current of steam, and

the vanillin-aniline finally split up by boiling for a short time with 50 per cent. sulphuric acid. After separating the vanillin with ether it was readily obtained in crystals. The same procedure is applicable for the production of aceto-vanillin from acetyl-vanillo-carbonic acid.—Pharm. Journ., Jan. 30, 1897, 82: from Comp. rend., cxxiv., 38.

Natural Cumarin—Purification.—Edo Classen observes that crude natural cumarin occurs usually mixed with pieces of tonka bean, sand, etc. It may be purified by repeated crystallization from hot alcohol, or, if preferred, by the use of benzin of low specific gravity—say of specific gravity 0.710. The cumarin is heated in a copper still, provided with a condenser, with the benzin for five to ten minutes, and the solution is then decanted into warm bottles. When cold, the crystals are collected, the benzin solution returned to the still, and this operation is repeated as often as necessary to extract all the cumarin from the crude article. At first the crystals are white, and often quite large. Afterwards they become sometimes colored. The cumarin remaining in the final mother-liquor may be shaken out with a 5 per cent. aqueous solution of sodium hydrate and precipitated from this by HCl.—Pharm. Rev., Feb., 1897, 28.

Chrysotoxin.—The essential pharmacological representative of *Ergot* under "Materia Medica."

Parthenin — Character, etc.—See *Parthenium Hysterophorus*, under "Materia Medica."

Glutamine—Wide Distribution as a Plant Constituent.—Glutamine, a homologue of asparagin, was first isolated by Schulze and Boshard from beet-root juice in 1883, and subsequently it was obtained from the shoots of *Cucurbita pepo* and *Helianthus annuus*, and from the tubers of *Stachys tuberifera*. E. Schulze has since found that glutamine is very widely distributed, and probably plays the same part as asparagine, which it appears to replace in some instances. It is found in many of the *Cruciferæ* and *Caryophyllaceæ*, in *Filices*, and in the shoots of *Picea excelsa*. Glutamine crystallizes in colorless needles; it is anhydrous, slightly soluble in cold water, readily soluble in hot water, and insoluble in alcohol. By heating with alkalies or baryta water glutamine is decomposed with evolution of ammonia, and is converted into glutamic acid, $C_5H_9NO_4$; its composition being $C_5H_{10}N_2O_3$. The method of extraction consists in first purifying the plant juice by means of basic lead acetate, then precipitating with mercuric nitrate. The precipitate, containing a mercury compound of glutamine, is decomposed with sulphuretted hydrogen, and the clear filtered liquid evaporated until it crystallizes. Sometimes the glutamine thus obtained is accompanied by asparagine, tyrosine, or arginine. From tyrosine it may be separated by its greater solubility in water; arginine may be precipitated by phosphotungstic acid; while the crystals of asparagine, being more compact, can be mechanically separated from the

lighter needles of glutamine.—Pharm. Jour., Oct. 3, 1896, 289; from Berichte, 1896.

Proteacin—Source.—The botanical source of the active principle described under the name of "proteacin" being somewhat doubtful, E. M. Holmes has obtained from Mr. J. Meiring specimens of the plant from which the proteacin was obtained. The plant on examination proved to be *Leucadendron decurrens*, R. Br., a species with lanceolate, spatulate, sub-decurrent and glabrous leaves, with the calyx of the male flowers wholly glabrous, and that of the female flowers with a hairy tube and a glabrous limb. In *L. concinnum*, R. B., to which the plant is attributed by Merck (see Proceedings 1896, 543), the leaves are lanceolate oblong and the calyces hairy, and the twigs hairy near the apex. The leaves also are only about half the width of those of *Leucadendron decurrens*.—Pharm. Journ., Dec. 26, 1896, 545.

COLORING MATTERS.

Plant Pigments—Classification.—Miss M. J. Newbigin gives a detailed account of the various coloring matters of leaves and flowers, which she divides into lipochromes and anthocyans, the former being insoluble the latter soluble in water. The authoress states that there is no evidence that lipochromes are in any way derivatives of chlorophyll. She groups them into two classes, eucarotins and carotinins. Anthocyans are probably derivatives of tannins. The theory that their chief purpose is to protect chlorophyll against decomposition in a strong light is scarcely in harmony with some of the conditions under which they are commonly formed, as, for example, in young shoots in spring, and in autumn leaves. Etiolin is probably nearly allied to chlorophyll, these two being nearly the only pigments in the vegetable kingdom which contain nitrogen.—Pharm. Journ., April 3, 1897, 289; from Trans. Bot. Soc., Edinburgh, xx., 534.

Vegetable Coloring Matters—Varieties.—L. Weigert observes that there are two well-marked classes of red coloring matters in the vegetable kingdom; the wine-red, which occurs in *Ampelopsis, Rhastyphina, Comus sanguinea*, etc.; and the carrot-red, in the beet, *Amaranthus*, fruit of *Phytolacca*, etc. The mallow-violets, as in *Coleus*, etc., form another group. In black grapes and in whortleberries there are two pigments, one of which is a glucoside; the coloring matter of yellow vine leaves is a glucoside, as is also that of the mallow. The pigments of the grape and whortleberry appear to belong to the class of tannins.—Bot. Centralbl., 1896, 353.

Yellow Coloring Matters—Investigation of Various Materials.—A. G. Perkin, in conjunction with several other chemists, has investigated the nature of the yellow coloring matters contained in various materials. The yellow coloring matter contained in the bark of *Myrica Nagi*, for which Perkin and J. J. Hummel propose the name "myricetin," is most probably

a hydroxy-quercetin. The yellow needles closely resemble quercetin, have the formula $C_{15}H_{10}O_8$, and yield compounds with mineral acids, which are decomposed by water into the free acid and coloring matter. Sicilian sumach, the dried and powdered leaves of *Rhus coriaria*, is found by Perkin and G. Y. Allen to contain the same coloring matter, together with some quantity of free gallic acid. The wood of *Quebracho colorado* also contains a yellow coloring matter, $C_{15}H_{10}O_6$, and Perkin and O. Gunnell consider that the needles in which this occurs are identical with fisetin, the coloring matter of young fustic (*Rhus cotinus*). In addition, they found ellagic acid and a considerable quantity of gallic acid present, both compounds having apparently been formed during the isolation of the fisetin.—Pharm. Journ., Aug. 29, 1896, 177; from Proc. Chem. Soc.

Xanthophyll—Microscopic Exhibition in Leaves.—Molisch communicates a method of exhibiting xanthophyll crystallized in leaves after extracting all the chlorophyll by digesting the fresh green leaves, or small pieces of them, in 40 per cent. alcohol, which contains 20 per cent. by weight of KOH. In this liquid they remain protected from light for several days, until all the chlorophyll is extracted. To prevent absorption of CO_2 this should be done in glass jars with well-fitting stoppers. The potash is washed out for several hours with distilled water, and bits of the leaves then permanently mounted in pure glycerin. The xanthophyll is found crystallized in almost every previously chlorophyllous cell. The author includes xanthophyll as well as chrysophyll, etiolin, phycoxanthin, etc., in the carotin group. He proposes to use the word carotin in a generic sense for all the yellow and orange red crystals of the leaf obtained by the method described.—Pharm. Journ., Aug. 29, 1896, 180; from Bot. Gaz., July, 1896, 66.

Quercetin—Presence in Onion Skins.—A. G. Perkin and J. J. Hummel have isolated the coloring matter in the outer skin of onion bulbs, and they have proved conclusively that it is quercetin. It is customary to use these skins for dyeing Easter eggs, and the authors found that it is possible to dye textile materials in the same manner, the coloring power of the onion-skins being quite equal to that of old fustic and quercitron bark. With an aluminum mordant it dyed calico a full bright yellow, and with iron a dark, greenish olive. Samples of wool mordanted with chromium, aluminum, tin or iron, were dyed brownish-olive, yellow, bright orange, or greenish olive respectively. It is interesting to note with regard to the quercetin group of compounds, that whereas fisetin is only known to exist in young fustic (*Rhus cotinus*), luteolin in weld (*Reseda luteola*), morin in old fustic and jackwood (*Morus tinctoria* and *Artocarpus integrifolia*), and rhamnetin and rhamnazin in Persian berries, quercetin has been found in quercitron bark, Persian berries, catechu, tea-leaves, apple-tree bark, horse-chestnut bark, and numerous other natural products, the outer scales of the onion bulb being the latest discovered source of the compound.—Pharm. Journ., Aug. 29, 1896. 177; from Journ. Chem. Soc., lxix., 1295.

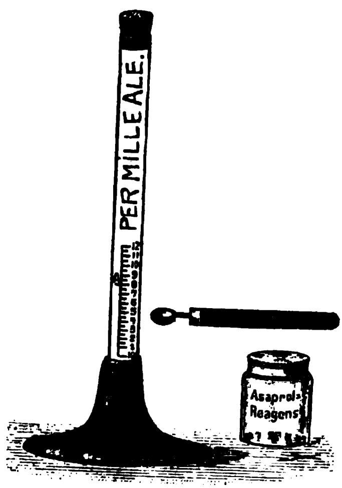
ALBUMINOIDS.

(Including Organized Ferments, Toxins, and Antitoxins.)

Albumen—Method of Drying.—Proshauer recommends the drying of egg-albumen by applying it with a brush upon porcelain plates and placing them where they are exposed to moderate heat. When dry the surface of albumen is cut in radiating lines with the sharp point of a knife, when the dry sections detach themselves in form of lamellæ. Thicker lamellæ, if desired, may be obtained by making several applications with the brush. —Zeitschr. Oest. Apoth. Ver., Aug. 1, 1896, 572.

Albumin—New Method of Estimation.—E. Riegler proposes a method for determining albumin in urine which depends upon its precipitation by a mixture of equal parts of asaprol and citric acid, and estimating the quantity in the instrument shown by Fig. 69. This consists of a glass cylinder, graduated, and mounted on a foot. A portion of the asaprol mixture, measured by the little spoon shown, is placed in the cylinder, and water added to the mark A, and solution effected by shaking. Urine is then poured in up to the mark U, a rubber stopper inserted in the opening, and the tube slowly inverted ten times. The cylinder is then set aside for twenty-four hours, and the amount of albumen present in 1 liter of urine is directly shown by the numeral at the surface of the deposit.

FIG. 69.



The asaprol-citric-acid mixture may also be qualitatively used for albumen in an ordinary test tube, a cloudiness or precipitate, when not dissipated by boiling, indicating the presence of albumen with certainty.—Amer. Drug., Aug. 25, 1897, 228.

Albumin—Improvement of Tanret's Test.—A. R. Elliott observes that those who have investigated the relative delicacy of the different tests for albumin all unite in naming Tanret's reagent, or the potassio-mercuric-iodide method, as the most sensitive. It cannot, however, be depended upon as an exclusive test, because of its property of precipitating not alone minute traces of albumin and of its modifications, but also the pine acids and the alkaloids. This fault, however, becomes a virtue when employed in the manner here proposed by the author, the reagent (prepared by dissolving 3.32 Gm. potassium iodide, 1.35 Gm. mercury bichloride, separately in 64 Cc. of distilled water, and adding 20 Cc of acetic acid) being applied by him as follows: To a test tube, half full of urine, add from five

to ten drops of acetic acid and about one dram of potassio-mercuric-iodide reagent. If albumin in any form or in the smallest amount be present, a precipitate will result. If there be no reaction, it is proof that the urine is free from all albuminous bodies, and further search may be abandoned. If a precipitate form, it is heated over a spirit flame. If due to peptone, proteose or alkaloids, it will disappear or become perceptibly diminished, but will remain unaffected or be intensified if produced by serum albumin, mucin or oleoresins. In the event of the precipitate persisting after the application of heat, some fresh urine is submitted to the potassium ferrocyanide test. If a positive reaction follows, it indicates the presence of serum albumin, since, as before pointed out, that body is the only proteid affected by this test. A negative result shows the body present to be either mucin or oleoresins. These can be readily distinguished by adding alcohol to the original precipitate produced by the potassio-mercuric-iodide reagent, when, if due to oleoresins, it will clear up, whereas if produced by mucin it will be unaffected. Returning to the second alternative: If heating causes a disappearance of the original precipitate the indication is that either peptones, proteoses or alkaloids are present. The potassio-mercuric-iodide test is again applied to some fresh urine, and the precipitate is shaken up with ether. If it disappears the reaction has been produced by the presence of alkaloids. If due to peptones or proteoses, it is not dissolved by ether. These two latter bodies may be differentiated by means of the ammonium sulphate test.—West. Drug., Jan. 1897, 18; from New York Med. Journ.

Proteids—Compounds with Halogens.—F. Blum finds that in their reaction with proteids the halogens replace hydrogen, and that the hydracids formed are then attached to the proteid molecule until its capacity for the acid is exhausted. Dr. Blum has experimented with

Iodo-albumin so obtained, and has obtained encouraging results in cases of parenchymatous goitre, in experimental tetanus, and in myxœdema. He has obtained similar good results with

Bromo-albumin in epilepsy, and with

Chloro-albumin in stomach disorders. The iodine and bromine compounds have been obtained by Paulman in form of definite pulverulent preparations, containing respectively 15 per cent. iodine and 10 per cent. bromine, and given by him the names of "iodosinum" and "bromosinum."—Münch. Med. Wochenschr., 1896, 43, 1099.

Bromalbumin—Characters, etc.—Blum, Hunrath and Paulman, having recently and almost simultaneously introduced various halogen compounds of albumin, Dr. O. Loew, of Tokio, Japan, calls attention to the fact that he had prepared a compound of bromine and albumin, named bromalbumin, as far back as 1885, and concerning which he states the following: After removing the loosely-combined bromine, the preparation still con-

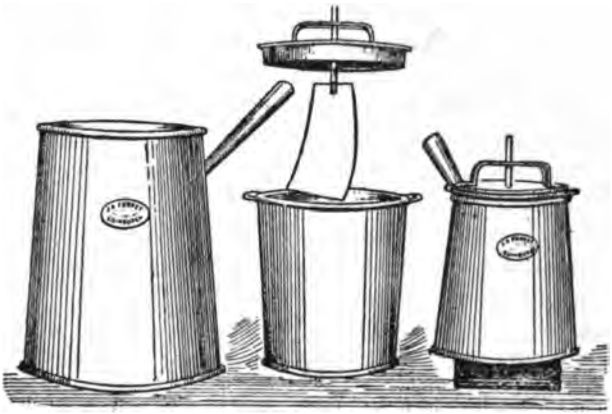
tains 16.16 per cent. of bromine in stable combination, and after dissolving in ammonia and precipitating, still contains 13.1 per cent. This product no longer yields potassium sulphide on boiling with an alkali; decomposition with mineral acids yields no tyrosin, and boiling with Millon's reagent no red coloration; it does give the biuret-reaction, however. These reactions are precisely those that albumin shows after slight oxidation with potassium permanganate. The writer also adds that by reducing the amount of bromine to half that of the weight of albumin, and warming for several days at a temperature of 50°–60° C., the same bromalbumin is had upon removing the loosely-combined bromine by means of sulphurous acid.—Merck's Rep., June 1, 1897, 343; from Pharm. Ztg., 1897, 283.

Ferro-Sodium-Citro-Albuminate—A New Hematinic.—Dr. Guiseppi Tarozzi recommends ferro-sodium-citro-albuminate as a readily absorbable hematinic, in doses of 1.5 Gm. a day for adults, and 0.25 to 0.5 Gm. for children, taken in aromatic syrup or in soup. It contains 30 per cent. of iron, is quite hygroscopic, and readily soluble in water. It may, therefore, be given hypodermatically, without any fear of local irritation, since its composition is analogous to that of blood.—Pharm. Ztg., Jan. 16, 1897, 45.

Protogene—A New Class of Albumin Compounds.—Dr. F. Blum has introduced some new synthetic compounds of albumin with methylene, which are produced by the action of formaldehyde upon serum- or ovi-albumin. These compounds, to which the author gives the general name of "protogene," are free from formaldehyde, and may, in all probability, be regarded as albumin in which two atoms of hydrogen, of one or two amido groups, are replaced by the radical "methylene." The new compounds are characterized by their non-coagulability when their aqueous solutions are heated. *Ovi-protogene* is marketed in the form of a yellow, dry powder containing about 7.1 per cent. of water and about 12.7 per cent. of nitrogen. When heated in a drying closet until all the water is removed it becomes partially insoluble.—Zeitschr. Oest. Apoth. Ver., Aug. 10, 1896, 600.

Milk—A Simple Sterilizer.—J. A. Forret has devised a simple sterilizer, which is shown by Fig. 70. It is thoroughly tinned outside and in after it is made, the joints being thus less liable to rust. It is so made that the different parts are easily made thoroughly clean, and the inner vessel, for the reception of the milk, is provided with a stirring-blade, which may be turned without moving the lid—water being poured in the outer vessel to the depth of about an inch and a half, the inner vessel replaced, and the apparatus heated over a convenient fire. When the water boils the milk is poured in the inner vessel (capacity for one pint) and continue the boiling with closed lid, under frequent stirring, for seven minutes (for two pints twelve, for three pints fifteen minutes). Remove the sterilizer from the fire, and after fifteen minutes, during which occasional stirring must be

FIG. 70.



A B C

continued, set aside in a cool place until wanted for use.—Pharm. Journ., April 3, 1897, 293.

Human Milk—Composition.—Fr. Soeldner and Wm. Camerer have analyzed human milk and find that it contains less proteid matter than has hitherto been supposed. 100 Gm. of milk, usually collected in the second week after parturition, contain 1.52 proteid; 3.28 fat; 6.5 sugar; 0.27 ash; 0.05 nitric acid; 0.78 unknown extractive; 12.4 total dry residue. The unknown extractives, which are almost absent in cow's milk, are increased in the colostrum.—Pharm. Rev., Sept., 1896, 206; from Zeitschr. Biol., *33*, 43.

"*Mule*" *Milk—Composition.*—W. H. Ince observes that a mule producing milk is of such rare occurrence that, as far as he has been able to find out, no recorded analysis exists. A Kentucky mule at San Fernando (Trinidad, B. W. I.) has for some weeks past produced milk, yielding about five to six quarts nearly every day. The udders at times enlarged to a considerable size, and the animal seemed greatly relieved after being milked, and worked with greater cheerfulness. A sample of the milk gave on analysis the following results, the constituents of average samples of cow's, ass's and mare's milk being included in the table for comparison:

	Mule.	Cow.	Ass.	Mare.
Specific gravity	1028	1028 } 1035 }		
Water	90.72	86.56	90.70	82.84
Total solids	9.28	13.44	9.30	17.16
Proteids	2.19	4.08	1.70	1.64
Fat	1.10	4.03	1.55	6.87
Milk sugar	5.50	4.60	5.80	} 8.65
Mineral salts	.49	.73	.50	
Cream	.50			

The above figures show how closely the milk of a mule resembles that of an ass, and differs entirely in composition from the milk of a cow or mare. The milk is much more transparent than cow's milk; it has a faint, milky odor, and tastes sweeter than usual. Under the microscope it resembles "separated milk." It decomposes less rapidly than cow's milk: the latter in this climate sours in six or eight hours, whereas the former remained sweet after standing two days in the creamometer. It coagulates slowly with alcohol and hydrochloric acid, and turns brown only on prolonged boiling with the latter. The ash contains a considerable quantity of phosphates and a trace of chlorides.—Pharm. Jour., Aug. 22, 1896, 176.

Referring to Mr. Ince's analysis of "mule" milk, Alfred H. Allen calls attention to an analysis, recorded in "Chem. News" (lxviii., 168), by Aubert and Colby of the milk of an eleven year-old mule. The animal was fed oats and hay, and the yield of milk was about two quarts daily. The results of Mr. Ince appear to agree very well with those of Aubert and Colby, which are given, with Mr. Ince's, in a table accompanying Mr. Allen's communication.—Pharm. Journ., Sept. 12, 1896, 247.

Cream—Preservation with Formaldehyde.—J. V. Riggs finds that cream for the soda fountain may be perfectly preserved for at least ten days, and probably much longer, by the addition of thirty minims of formaldehyde to a gallon.—Merck's Report, Oct. 1, 1896, 510.

Casein—Use as Emulsifier.—Frederick Lester, in view of the claim of the manufacturer of an emulsifier, that it is composed of casein, sodium bicarbonate, and sugar, has made some experiments, using casein in different proportions in making emulsions. His results are unfavorable to casein as an emulsifier to take the place of acacia and other agents used in pharmacy. While it readily emulsifies some oil, it fails to make a permanent emulsion. Such emulsions, while readily recombined by shaking, do not keep well. Besides, in using casein it is necessary to use an alkali to dissolve it, which in the great majority of cases would be objectionable.—West. Drug., July, 1896, 297.

Iodothyroidin—Method of Obtaining a Standardized Preparation.—Catillon observes that much confusion has arisen in the nomenclature of thyroid preparations, through the use of trade names which are misleading and often incorrect. He describes a method for preparing the active portion of thyroid for medicinal use in the form of a standardized product, which he calls "iodothyroidin," as follows: The glands are submitted to pancreatic digestion with pancreatin and water; the residue is extracted with petroleum ether, dissolved in dilute soda solution and filtered, the filtrate slightly acidulated with dilute sulphuric acid, when the active principle is precipitated. This is collected and washed, the amount of iodine in a portion determined, and sufficient sugar of milk added to the bulk to reduce the iodine content to 0.0003 gramme in each gramme of

finished product.—Pharm. Jour., April 3, 1897, 287; from Les Nouv. Rem., xiii, 129.

Yeast—Manufacture.—The following outline of the process of yeast manufacture, as conducted at the Netherlands Yeast and Spirit Company's Works in Delft, which produce nearly a hundred tons of yeast per week, is given in "Engineer:" The first step towards its manufacture is the conversion of barley, rye, and Indian corn, into malt. After malting and drying in kilns, the malt is macerated in large wooden tubs and then introduced into the fermentation tubs, together with a fermenting agent previously prepared by mixing yeast and flour. After fermentation, the yeast appears in a frothy state on the top of the liquid, and is conducted through channels into a common reservoir, then passed through sieves to effect cleansing. It is next collected in a milky state, and after repeated washings in clean water, transported to filter presses, which remove excess of moisture, leaving a solid cake—the yeast of commerce. The spirituous liquor formed as a by-product during the fermentation process, after being drawn off and rectified, is bottled and sold as Hollands gin.—Pharm. Journ., Jan. 30, 1897, 83.

Yeast—Influence of Oxygen.—Referring to a statement by Chudiakow, that the fermentation of sugar solution is retarded by passing air through the liquid, R. Rapp suggests that the observations upon which it was founded were misleading. His experiments show that oxygen is essential for the multiplication of yeast cells, and that it does not influence fermentation, but that violent agitation of a fermenting liquid may sometimes stop fermentation.—Pharm. Journ., Oct. 31, 1896, 377; from Berichte, xxix., 1983.

Yeast—Extraction of a Liquid Ferment.—Dr. E. Buchner describes a liquid ferment which he has extracted from yeast by pressure. The new ferment, which he has named

Zymase, is capable of causing cane-sugar or grape-sugar to undergo alcoholic fermentation in the absence of yeast cells, but milk-sugar is not affected by it. The addition of chloroform to this ferment, even up to the saturation point, does not interfere with the fermentative process, although causing a rapid precipitation of albuminous matter. It is apparently of a proteid nature, coagulating when heated to about 50° C., and thus losing the power of exciting fermentation.—Pharm. Journ., April 3, 1897, 288; from Berichte.

Pepsin—Comparison of the U. S. P. Standard with that of Foreign Pharmacopœias.—C. C. Sherrard reviews the standards for pepsin of the United States, the Austrian, Belgian, British, Danish, French, German, Swiss, Italian, Norwegian, and Spanish Pharmacopœias, and summarizes them for convenient comparison in form of a table. The points of information desired are the outgrowth of a considerable demand for the better

grades of American pepsins, and it is desirable to know what a U. S. P. 1 : 3000 pepsin will test according to the various European Pharmacopœias, or the strength indicated by their pepsin when assayed according to the U. S. P. method, together with the sugar of milk necessary to reduce a U. S. P. article to the various standards. The table illustrates the fact that no uniformity prevails in the various countries relative to the assay of pepsin, and the various schemes adopted are purely arbitrary, without any reference to the theoretical or real activity of the gastric juice. It is, moreover, surprising how crude some of the foreign pharmacopœial tests are, when we consider the number of able chemists these countries can produce. There is a wide variation in the time allotted, temperature, amount, kind and condition of albumen or proteids, acidity, kind of sieve, and percentage of pepsin used in applying the test. Any one of these variations causes a greater or less difference in the results.—Proc. Mich. State Pharm. Assoc., 1896, 38–46.

Diastase—Conditions of Formation in Fungi.—Prof. W. Pfeffer has endeavored to determine the conditions under which diastase is formed in some of the lower plants, such as *Penicillium glaucum*, *Aspergillus niger*, *Bacterium megaterium*, and finds that an increase in the amount of sugar in the nutrient fluid always has the effect of decreasing the production of diastase. No such result was produced when the sugar was replaced by some other carbohydrate, or by glycerin or tartaric acid. He considers that the arrest in the production of diastase is due to irritation exerted on the organism by a solution of sugar of a certain degree of concentration.—Pharm. Journ., April 3, 1897, 290; from Ber. Sächs. Ges. Wiss., Dec. 7, 1896.

Laccase—Existence along with Tyrosinase.—In continuation of previous observations on laccase (see Proceedings 1896, 848), G. Bertrand finds that laccase and tyrosinase exist simultaneously in species of *Russula*. Thus, *Russula delica*, Fries., after maceration with chloroform water and pressure, yielded a mucilaginous liquid from which a precipitate was thrown down by alcohol. The filtrate, after concentration by distillation in a vacuum, oxidized hydroquinone and pyrogallol with great energy, but was without action on tyrosin, the action of alcohol and the heat employed having destroyed the tyrosinase present. The precipitate, however, retained the oxidizing properties of the primitive juice, and though after purification and solution in water it did not affect hydroquinone or pyrogallol, it caused rapid oxidation of tyrosin. It seems possible, therefore, to extract from certain fungi a liquid very rich in laccase, but without action on tyrosin; and, on the other hand, to obtain from the same plants a solution practically free from the ferment, but manifesting the effects of tyrosinase.—Pharm. Journ., Oct. 3, 1896, 291; from Comp. rend., cxxiii, 463.

Lipase—A Saponifying Ferment from Blood.—It is stated in "Pharm.

Centralh." (xxxviii, 278) that a peculiar ferment has been obtained from blood serum which possesses the property in a very high degree of saponifying fat. The same ferment is found in the pancreatic juice and in the liver. It loses its property as a ferment upon being heated to 90° C.—Merck's Rep., June 1, 1897, 343.

Antitoxin—Efficacy in the Treatment of Diphtheria.—In a presidential address before the British Association for the Advancement of Science, Sir Joseph Lister makes some remarks which may be accepted as indicating in a concise and accurate way the present status of diphtheria antitoxin. It was shown several years ago by Roux and Yersin, that the bacillus of the false membrane of diphtheria patients may be cultivated in nutrient fluids, and that these fluids, after the removal of the microbes by filtration, retain poisonous qualities of astonishing intensity, comparable to that of the secretion of the poison-glands of the most venomous serpents. This poisonous product of the bacteria, called a toxin, was thus proved to be a chemical substance in solution, the action of which is distinguished from that of the special bacillus producing it, in that it is absorbed into the blood, and so poisons the system, while the bacillus does not become absorbed, but remains confined to the surface on which it first appeared. Each poisonous microbe appears to form its own peculiar toxin, a special toxin of extreme potency being produced from the bacillus of tetanus, and another from the tubercle bacillus, etc. It is true that Koch's sanguine anticipations with tuberculin were not realized; but his labors were not fruitless, since his pupil, Behring, has expressly attributed to Koch's work on tuberculin the inspiration of the work which led him and his colaborateur, Kitasato, to their surprising discovery of antitoxic serum. They found that if an animal of a species liable to diphtheria or tetanus received a quantity of the respective toxin, so small as to be harmless, and afterwards, at suitable intervals, successively stronger and stronger doses, the creature, in course of time, acquired such a tolerance for the poison as to be able to receive with impunity a quantity very much greater than would at the outset have proved fatal. But the most remarkable result observed by them was that, if blood was drawn from an animal which had acquired this high degree of artificial immunity, and some of the clear fluid or serum was introduced under the skin of another animal, this second animal acquired a strong, though more transient, immunity against the particular toxin concerned. The serum in some way counteracted the toxin, or was antitoxic. Furthermore, it was found that if some of the antitoxic serum was applied to an animal after it had received a poisonous dose of the toxin, it preserved the life of the creature, provided too long a time had not elapsed after the poison was introduced. In diphtheria the bacilli very early manifest their presence by the false membrane, so that the antitoxin appeared to have a fair chance to act as a curative; but if it left the bacilli intact, not only would repeated injection be required to

maintain the immunity of the poison perpetually secreted by the microbes, but the bacilli might, by their growth and extension, cause obstruction to the respiratory organs. Fortunately Roux was able to show by experiments on animals that a diphtheritic false membrane, rapidly extending and accompanied by surrounding inflammation, was brought to a stand by the use of the antitoxin, and soon dropped off, leaving a healthy surface. The antitoxin, therefore, not alone renders the toxin harmless, but causes the microbe to languish and disappear, and thus proves an absolute cure for diphtheria, if only it can be applied in time. And it is upon this that Sir Joseph Lister lays great stress. He cites the evidence obtained from numerous cases in the six large hospitals of London, which is pronouncedly in favor of the serum treatment of the disease, and concludes that while there are certain cases of so malignant a character that no treatment will probably ever be able to cope with them, it seems probable that Behring's hope that the mortality may be reduced to 5 per cent. will be fully realized when the public become alive to the paramount importance of having the treatment commenced at the outset of the disease.—Amer. Jour. Pharm., Nov. 1896, 612–617.

Antitoxic Serum—Effects in Diphtheria.—Dr. Wesener concludes a temperate article in which he answers the questions raised by a number of critics of the antitoxic serum treatment of diphtheria, as follows:

1. In simple diphtheria of the fauces the serum treatment tends to prevent extension to the larynx, but otherwise effects neither more nor less than thorough local treatment.

2. In diphtheria of the larnyx, serum treatment appears to obviate the necessity for tracheotomy in some cases.

3. In diphtheria of the larynx the serum is the best preventive agent against extension of the disease to the trachea and bronchi. If the trachea and bronchi are already affected the serum treatment is of doubtful value.

4. Against septic processes present when the serum treatment is applied, it is of less avail than ordinary local measures.

5. The immunizing capacity of the serum has not yet been proved to exist.

6. The serum treatment is not injurious.—Pharm. Journ., Jan. 16, 1897, 43; from Münch. Med. Wochenschr.

Diphtheria Antioxin—Composition.—Dr. Gordon Sharp has subjected diphtheria antitoxin to chemical examination, and communicated the results to the British Pharmaceutical Conference. He found that the proteid bodies isolated were of the same character as those in normal serum. Neither alkaloids nor characteristic crystalline bodies could be obtained, and experiments made to obtain a ferment resulted in the negative. Albuminose, which was present, was more abundant in old than in recent samples.—Yearbook of Pharm., 1896, 363–369.

Antitoxin—Artificial Production by the Aid of Electrolysis.—Dr. Smirnow has discovered an electrolytic method for the production of antitoxin from diphtheria toxin. It consists in a process of chlorination by the electrolysis of the toxin, containing 0.5 per cent. of sodium chloride with the aid of carbon electrodes on the positive, and then the removal of the chlorine by substituting for the carbon electrodes silver electrodes, changing the latter several times. Experience has determined that the potency of the antitoxin so produced depends upon the time of chlorination. The author's observations lead him to the conclusion that antitoxin is simply an *oxidized or hydroxylated toxin* produced by the aid of electricity, solely by the action of the electrolytic products of decomposition of the salts in the solution upon the bacterial products present. Experiments made upon guinea pigs show the artificial antitoxin obtained by the author's method to be equal in efficiency to that obtained in the usual way, and he has thus established the important facts that for the formation the animal organism is not alone unnecessary, but that the artificial method by electrolysis is both more efficient and simple.—Zeitschr. Oest. Apoth. Ver., Aug. 10, 1896, 599.

Antitoxins—Therapeutic Resumé for the Past Year.—The following paragraph by Nestor Tirard constitutes an interesting summary of the therapeutics of antitoxins during the past year: "The main interest of the year has centered in the various forms of treatment with antitoxins; and evidence continues to accumulate, indicating that for diphtheria at least we possess in antitoxic serum a remedy of distinctly greater value than any other with which we are acquainted. The use of tetanus antitoxin, of antivenene for snake bites, of anti-streptococcus serum, and of many others, continues to attract attention, though, for the present, many are disposed to wait for further evidence of their value. The patient investigation of the claims of the serum treatment has not, however, prevented the accomplishment of a great deal of sound work, which has included in its scope a consideration of older remedies, as well as those of more recent introduction. Experience has shown that toxic symptoms may arise from the incautious use of many drugs. Considerations of the victorious march of progress, even in therapeutics, should not render us unmindful of possible dangers in the ground already traversed. Sundry suggestions have been made for facilitating the employment of older remedies which have recently, perhaps, been somewhat neglected owing to the introduction of more palatable preparations. The new remedies which claim attention are not so numerous as usual, and with the exception, perhaps, of eucaine, it cannot be said that they present any striking characteristics. Many are synthetic preparations; some are recommended as antiseptics, others as soothing local applications, while others are astringent, both locally and after absorption."—Pharm. Rev., April, 1897, 78; from Yearb. of Treatment, 1897, 445.

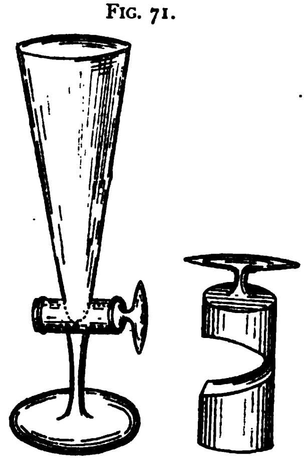
Tuberculin—Encouraging Results.—R. Koch, attributing the failure of tuberculin as a remedy to the circumstance that, while producing a reaction against the toxin generated by the tubercle bacillus, it did not produce immunity against the bacillus itself, has made some further investigations from which he considers important results have been obtained. On the basis of observations on the influence of a preparation obtained by extracting the bacilli with weak soda liquor and containing dead bacilli, he has been led to try the effect of mechanical disintegration, and by that means has produced a preparation distinguished as TR, which he believes will give immunity against the tubercle bacillus, as well as against the toxin it generates. Clinical experiments appear to be favorable to Dr. Koch's view, but the results are described with much reserve, and it remains to be seen whether or not an important advance has been made.—Pharm. Journ., May 1, 1897, 367; from D. Med. Woch., 1897, No. 14.

Antivenene—Reported Success in the Cure of Snake-bite.—Surgeon-Major Rennie describes a case of supposed cure of a Hindu boy who had accidentally stepped on a snake, which, according to the practically conclusive testimony of two eye-witnesses, was a "krait," one of the most dangerous of Indian reptiles. Subcutaneous injection, within three minutes after the bite, of 8 Cc. of Calmette's antivenene, followed by hypodermic treatment with permanganate, resulted in a cure without any bad symptom.—Pharm. Journ., Nov. 28, 1896, 457.

URINARY COMPOUNDS.

Urine Sediment Glass—New Construction.—Dr. Ed. Spaeth has devised the sediment glass shown by Fig. 71. The sediment is caught in the glass cock, cut as shown, and when entirely collected, the cock is turned so as to entirely inclose it, and shut it off from the other contents of the glass, which are then discarded, the glass washed, and the sediment obtained ready for treatment by again turning the cock around.—Merck's Rep., Mar. 15, 1897, 186; from Ztschr. f. Angew. Chem.

FIG. 71.



Urine Sediment Glass.

Urine—Action of Formaldehyde on its Constituents.—Cotton has studied the influence of formaldehyde in the analysis of urine with the following results: Formaldehyde augments the reduction of both Fehling's solution and Almén's bismutho-sodic solution, a fact that might lead to the inference that a very large quantity of glucose is present in the urine. Formaldehyde, notwithstanding its con-

siderable coagulative power on albumin, is a poor reagent for the latter, as its action is not immediate. It exerts a curious effect on uric acid, absolutely preventing its liberation in urine, even by the strongest acids. The insolubility of uric acid in water is well known; in formaldehyde, however, it dissolves rapidly and very easily, and upon evaporation a product is obtained that crystallizes in stellate prisms, and that is a combination of formaldehyde and uric acid. But formaldehyde, however, exerts a quite contrary effect on urea, forming with it an insoluble compound, which is very easily obtained upon adding a mineral acid to the urine, preferably hydrochloric acid. To precipitate the urea from urine, M. Cotton adds 20 to 25 drops of 40 per cent. formaldehyde to 10 Cc. of urine, and then 10 to 15 drops of hydrochloric acid. In urines rich in urea, almost the whole of it is precipitated at once; in those containing little, the precipitate first formed is collected, the liquid concentrated to one-tenth its volume, and upon cooling, a further crystallization takes place.—Merck's Rep., May 1, 1897, 281; from Rép. de Pharm., ix., 54.

Urine—Observations on Some Recent Sugar Reactions.—Frederick W. Haussmann records some experiments made to determine the value and reliability of several sugar tests that have recently been proposed. The first of these is Crissler's

Safranine Test, which is dependent upon the reduction of the red color of its solution to a colorless leuco-derivative upon boiling with urine containing more than 0.1 per cent. of glucose. The test is made by heating to boiling a mixture of equal volumes of urine, of normal sodium or potassium hydrate, and of solution of safranin 1 : 1000. Albumin, if present, must be removed, when any discharge of color may be set down as being due to sugar. The test is stated to remain unaffected by uric acid, creatine, creatinine, chloral, hydrogen dioxide, or salts of hydroxylamine. To these Mr. Haussmann adds the following as remaining unaffected in 10 per cent. solutions, used in the proportions of the test: Acetone, antipyrine, chloral hydrate, potassium chlorate, tannin, gallic acid, pyrogallol, resorcin, hypophosphites, oxalates, salicylates, peptone, cane sugar, and sodium phosphate, while egg albumin has only slight action. Milk sugar, on the other hand, has the same reaction as glucose, while the various conditions of abnormal urine that exert a reducing action upon copper solution also discharge the color of the safranine under the conditions of the test. The safranine test is, however, available only qualitatively. For quantitative determination Fehling's solution is to be preferred, one of its great advantages being the easy observation of the discharge of the blue color at the end of the reaction. The next test that has been studied by Mr. Haussmann is the

Cupric Salicylic Test, a modification of the copper test which consists in boiling 5 Cc. of the dark green test solution—produced by dissolving

2 parts each of cupric sulphate and sodium salicylate, and 8 parts of sodium carbonate, in sufficient distilled water to make 100 parts—with 5 Cc. of the suspected urine. In the presence of glucose a yellow precipitate is produced, whereas in its absence the precipitate formed will be gray or black. The author has examined this reaction with reference to its delicacy, and finds the limit of the reaction to be between 0.25 and 0.125 per cent. of glucose in the urine. He finds that milk sugar reacts like glucose, but the limit of the reactions must be placed at a higher percentage point. Finally, the author records some observations upon

Worm-Mueller's Modification of Fehling's Test, which is applied as follows: 1 Cc. of 2.5 per cent. cupric sulphate solution and 2.5 Cc. of 10 per cent. potassium-sodium tartrate in 4 per cent. sodium hydrate solution, are mixed and heated simultaneously with 5 Cc. of the urine to be tested in separate tubes to the boiling-point. The boiling is interrupted at the same time, and the tubes are allowed to stand 20–25 seconds, and their coutents are then mixed and allowed to stand. If in 5 or 10 minutes no cuprous oxide is precipitated, the test is repeated with an increase of 0.5 Cc. of the copper solution, the alkaline mixture remaining as before. The copper solution may in this way be increased until about 4 Cc. are taken. If glucose is present, the oxide will be suspended throughout the liquid in the form of a dirty yellowish-green cloud, and it is stated that 0.025 per cent. of glucose may be diluted in urine by this method. Mr. Haussmann's experience confirms the statement of Worm-Mueller as to the percentage found, but he finds that the test is affected by conditions resulting after the administration of piperazine, of creosote, of sulphonal, and of sodium salicylate, and that, moreover, the test is too tedious.—Amer. Jour. Pharm., July, 1896, 358–366.

Urine—Preparation of Methyl-Guanidine from the Creatinine Contained in It.—The following method for preparing methyl-guanidine from the creatinine contained in urine, which serves incidentally as a test for creatinine, is given by N. A. Orlow: The urine, without previous concentration, is precipitated by means of mercuric chloride solution and sodium acetate, and the washed precipitate boiled with water, unslaked lime and a small amount of freshly precipitated mercuric oxide, in order to accomplish the oxidation of the creatinine into methyl-guanidine and oxalic acid. It is necessary to employ *freshly* precipitated mercuric oxide, since the red or the dry yellow mercuric oxide does not react with creatinine solutions on boiling, as control experiments have shown. On boiling, the mercuric-chloride precipitate is reduced to metallic mercury by the lime, the solution becoming black, and the creatinine being oxidized. In one case, the precipitate, which had been produced in a urine obtained from an invalid suffering from oligocythemia, simply by boiling with water, acquired a grayish-black color. The methyl-guanidine that remains in the solution is precipitated as a difficultly soluble picrate by adding a concen-

trated solution of picric acid, evaporating the solution partially, and setting aside to crystallize. After a while, long, silky, dark-yellow crystals appear, yielding, on recrystallization from boiling water, thin, yellow, silky crystals, resembling coniine aurichloride. By this means the presence of creatinine could be determined in 30 to 50 Cc. of urine in over 20 specimens, both normal and pathological, without previous concentration being at all necessary. Perhaps quantitative estimations of creatinine may be possible by this means. The picrate obtained is decomposed by means of lead hydroxide or quinine, the methyl-guanidine being liberated.—Merck's Report, Oct. 1, 1896, 515; from Pharm. Ztschr. f. Russl., xxxv, 513.

NOTE: The Committee on Publication desires to make grateful acknowledgment of the kind loan of a number of electrotypes, used for illustration of this Report, by Messrs. E. R. Squibb & Sons, Merck & Co., Prof. Edw. Kremers, Prof. Henry Trimble and the American Druggist Publishing Company.

APPENDIX.

LIST OF COLLEGES AND ASSOCIATIONS,

HAVING ACCREDITED DELEGATES TO THE FORTY-FIFTH ANNUAL MEETING, HELD AT LAKE MINNETONKA, MINN., WITH THE NAMES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

Name.	*President.*	*Secretary.*
Chicago	A. S. Draper	W. L. Pillsbury.
Cincinnati	John Ruppert	A. W. Bain.
Cleveland	E. A. Schellentrager	Joseph Feil.
Louisville	O. A. Beckman	G. L. Curry.
Maryland	Chas. E. Dohme	E. B. Fischer.
Massachusetts	Linus D. Drury	W. D. Wheeler.
National	S. L. Hilton	W. H. Bradbury.
New York	Edw. Kemp	Thos. F. Main.
Philadelphia	Chas. Bullock	W. B. Thompson.
Pittsburg	Louis Emanuel	A. H. Poth.
St. Louis	Thos. Layton	J. C. Falk.

SCHOOLS OF PHARMACY.

Northwestern University	Oscar Oldberg, ***Dean.***
Purdue University	Arthur L. Greeu, ***Dean.***
University of Michigan	A. B. Stevens, ***Secretary.***
University of Minnesota	F. J. Wulling, ***Secretary.***

STATE PHARMACEUTICAL ASSOCIATIONS.

Name.	*President.*	*Secretary.*
Alabama	W. E. Bingham	P. C. Candidus.
Colorado	H. Reynolds	C. E. Ward.
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Illinois	Paul G. Schuh	Frank Fleury.
Indian Territory	H. D. Kinseley	H. H. Hokey.
Iowa	John L. Etzel	A. H. Miles.
Kansas	E. C. Fritsche	F. A. Snow.
Kentucky	V. Driskell	J. W. Gayle.
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Maine	F. H. Wilson	M. L. Porter.
Maryland	W. C. Powell	C. H. Ware.
Massachusetts	C. F. Nixon	Jas. F. Guerin.
Minnesota	E. C. Dorr	C. T. Heller.

Name.	*President.*	*Secretary.*
Missouri	Thomas Layton	H. M. Whelpley.
Nebraska	Fred. G. Fricke	B. C. Heilman.
New Hampshire	C. B. Spofford	F. L. Way.
New Jersey	H. O. Ryerson	Geo. T. Fitzgeorge.
New York	R. K. Smither	J. B. Todd.
North Carolina	J. P. Stedman	H. R. Horne.
North Dakota	T. W. Kibbee	W. L. Parker.
Ohio	G. B. Kauffman	L. C. Hopp.
Oklahoma	F. B. Lillie	E. DeBarr.
Pennsylvania	J. H. Redsecker	J. A. Miller.
Province of Manitoba	Chas. Flexon	A. D. Macdougall.
Province of Quebec	R. W. Williams	E. Muir.
Rhode Island	M. B. Wood	W. E. Cates.
South Dakota	L. T. Dunning	I. A. Keith.
Tennessee	B. H. Owen	W. Vickers.
Texas	H. L. Carleton	R. H. Walker.
Virginia	Jas. L. Avis	C. B. Fleet.

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St. Louis	O. F. Bausch	L. A. Seitz.

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Proprietary	Thos. Doliber	Joseph Leeming.
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Kings County Pharm. Assoc	A. Paradis	F. N. Bliss.
New York German Apothecaries Union	C. F. Schleussner	S. Faber.

LIST OF MEMBERS IN ATTENDANCE AT LAKE MINNETONKA.

Names of delegates indicated by *.

Allison, William O., New York, N. Y.
Alpers, William C., New York, N. Y.
Arny, Harry V., New Orleans, La.
*Bartells, George C., Camp Point, Ill.
Beal, J. H., Scio, O.
Behrens, Paul J., Chicago, Ill.
*Bent, E. C., Dell Rapids, S. Dak.
Betzler, Jacob, Newark, N. J.
Bobbitt, J. Hal., Raleigh, N. C.
*Boyce, S. F., Duluth, Minn.
Brown, Wm. T., Madison, N. J.
*Burns, E. M., Mason City, Ia.
*Cameron, Donald L., East Orange, N. J.
*Caspari, Chas., Jr., Baltimore, Md.
*Christianson, Lars, Fargo, N. Dak.
*Coombs, Chas. E., Boston, Mass.
*Danek, John F., Minneapolis, Minn.
Davis, Chas. L., Newburyport, Mass.
*Diehl, C. Lewis, Louisville, Ky.
Dewoody, W. L., Pine Bluff, Ark.
*Dohme, Chas. E., Baltimore, Md.
*Dunning, L. T., Sioux Falls, S. Dak.
*Ebert, Albert E., Chicago, Ill.
Eliel, Leo, South Bend, Ind.
Etzel, John L., Clear Lake, Ia.
Eyssell, George, Kansas City, Mo.
*Feil, Joseph, Cleveland, O.
*Fennel, Chas. T. P., Cincinnati, O.
Fieber, G. A., Cincinnati, O.
*Flexon, Chas., Winnipeg, Can.
*Ford, Chas. M., Denver, Colo.
Frerksen, Richard C., Chicago, Ill.
*Frost, William A., St. Paul., Minn.
Gamble, Stewart, Minneapolis, Minn.
Gane, C. H., New York, N. Y.
Gausewitz, William, Owatonna, Minn.
Getty, Wilmot S., St. Paul, Minn.
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Goodrich, George H., Anoka, Minn.
Hall, Alden T., St. Paul, Minn.
Hallberg, C. S. N., Chicago, Ill.
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Helfman, Joseph, Detroit, Mich.
*Heller, Chas. T., St. Paul, Minn.
*Hemm, Francis, St. Louis, Mo.
Herbst, Fred. W., Columbus, O.
Hereth, Frank S., Chicago, Ill.
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*Howard, Fletcher, Des Moines, Ia.
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*Huhn, Charles H., Minneapolis, Minn.
Humiston, Ray, Worthington, Minn.
Jacobs, Joseph, Atlanta, Ga.
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Kennedy, Geo. W., Pottsville, Pa.
King, Geo. A. N., Minneapolis, Minn.
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Kremers, Edward, Madison, Wis.
Kruegar, Owen A., Kansas City, Mo.
Kyeth, B. O., Lanesboro, Minn.
*La Pierre, E. H., Cambridge, Mass.
Lindvall, Chas. G., Moline, Ill.
*Lloyd, John U., Cincinnati, O.
*Loehr, Theodore C., Carlinville, Ia.
Lynch, Robert F., Monticello, Minn.
Lyons, Albert B., Detroit, Mich.
Lyons, Frederick W., Jersey City, N. J.
Main, Thomas F., New York, N. Y.
Mason, Harry B., Dannemora, N. Y.
Matthews, Charles E., Chicago, Ill.
*Mayo, Caswell A., New York, N. Y.
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Merrell, Charles G., Cincinnati, O.
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*Miller, T. Ashby, Richmond, Va.
*Moore, Chas. G., Eufaula, Ind. Ter.
Mork, T. K., Wheaton, Minn.

Morrison, Joseph E., Montreal, Can.
Morse, E. W., Mt. Vernon, Ill.
Murphy, John S., Pontiac, Ill.
Newman, George A., Louisville, Ky.
Nielson, John, Ortonville, Minn.
Ogier, John M., Cambridge, O.
*Oldberg, Oscar, Chicago, Ill.
*Orton, Ingomar F., Galveston, Tex.
*Parisen, Geo. W., Perth Amboy, N. J.
Parker, W. S., Lisbon, N. Dak.
*Patton, John F., York, Pa.
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Puckner, William A., Chicago, Ill.
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*Ramsperger, Gustavus, New York, N. Y.
Randall, Frank O., Brockton, Mass.
Rauch, Henry, Minneapolis. Minn.
Reidy, Michael, Corunna, Mich.
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Scherer, Andrew, Chicago, Ill.
Schmidt, J. H., Omaha, Neb.
*Schneider, Albert, Chicago, Ill.
*Schœttlin, Albert J., Louisville, Ky.
*Schuh, Paul G., Çairo, Ill.
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Slaughter, Philip M., Richmond, Va.
Sloan, George W., Indianapolis, Ind.
Sparks, J. M., Fort Smith, Ark.
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Tilden, Amos K., Boston, Mass.
*Torbert, Willard H., Dubuque, Ia.
Trautman, L., Wabasha, Minn.
*Wangler, C. D., Waterloo, Ia.
Wanous, Miss Josie A., Minneapolis, Minn.
Warren, Edwin A., St. Paul, Minn.
*Wetterstrœm, Albert, Cincinnati, O.
Webster, H. G., Minneapolis, Minn.
Werner, R. C., Brooklyn, N. Y.
*Whelpley, Henry M., St. Louis, Mo.
White, H. E., Jamestown, N. Dak.
*Whitney, Henry M., N. Andover, Mass.
*Willis, Henry, Quebec, Can.
Wittich, Matthew, Minneapolis, Minn.
Wood, Mason B., Providence, R. I.
Wulling, F. J., Minneapolis, Minn.

LIST OF NEW MEMBERS.

Baker, Maury D., Newport, R. I.
Bent, Edward C., Dell Rapids, S. Dak.
Bohn, Charles H., Philadelphia, Pa.
Bowen, Wm. A., Blantyre, Brit. Cent. Africa.
Breck, Frederick W., Boston, Mass.
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Davoll, David L., Jr., Chicago, Ill.
Denning, Michael, Fort Niobrara, Neb.
Dunning, Lyman T., Sioux Falls, S. Dak.
Elfstrum, Axel F., Willmar, Minn.
Etzel, John L., Clear Lake, Ia.
Flexon, Charles, Winnepeg, Can.
Freericks, Frank H., Cincinnati, O.
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Gamble, Stewart, Minneapolis. Minn.
Graham, Clarence M., Boston, Mass.
Graham, Frank R., Mercer, Pa.
Graham, Joseph H., Chelsea, Mass.
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Guise, P. Nettleton, Philadelphia, Pa.
Hammar, Alrik, Yokohama, Japan.
Hammel, Joseph, Medford, Wis.
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Henry, Hubert, Brooklyn, N. Y.
Huhn, Charles H., Minneapolis, Minn.
*Joerger, Frederick, Brunswick, Ia.
Johnson, Knute A., Granite Falls, Minn.
Kaenter, Frederick W., St. Louis, Mo.
Kelley, Charles M., San Francisco, Cal.
King, Campbell T., Macon, Ga.
Klock, George H., Brooklyn, N. Y.
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Kneuper, George M., New York, N. Y.
Kolb, William W., Key West, Fla.
Krakau, W. Esters v., San Francisco, Cal.
Krueger, Owen W., Kansas City, Kan.
Kyseth, Bernt O., Lanesboro, Minn.
Lamar, Henry J., Macon, Ga.
La Grange, John V. N., Mobile, Ala.
Larrabee, John, Melrose, Mass.
Legel, John G., Charles City, Ia.
Lindvall, Charles G., Moline, Ill.
Louis, Leopold G., New York, N. Y.
Lovvorn, James L., Bowdon, Ia.
Lynch, Frank K., Waltham, Mass.
Lynch, Robert F., Monticello, Minn.
Maguire, Edward S., Detroit, Mich.
Mares, Ferdinand L., Omaha, Neb.
Markoe, George B., Boston, Mass.
Matusow, Harry, Philadelphia, Pa.
May, Edward, Washington, D. C.
McMahon, Joseph, Brooklyn, N. Y.
McMonies, Thomas L., Chicago, Ill.
*Meyer, Alfred, New Orleans, La.
Meyer, Martin M., South Bend, Ind.
Miller, Charles, New Orleans, La.
Miller, Herman, Benicia Barracks, Cal.
Morse, Edwin T., Boston, Mass.
Mumma, D. Edgar, Hagerstown, Md.
Myers, Preston B., Omaha, Neb.
Myers, William H., New York, N. Y.
Nielson, John, Ortonville, Minn.
Noer, Olaf, Westby, Wis.
O'Gorman, Theophilus V., Chicago, Ill.
Osseward, Cornelius, Kalamazoo, Mich.
Parks, William N., Newport, N. Y.
Pearson, Joseph F., San Francisco, Cal.
Peck, Frank H., Memphis, Tenn.
Pine, Warren C., Riverside, N. J.
Portmann, Cæsar A., Jackson, Minn.
Quayle, Thomas A., New Orleans, La.

* Elected in 1896, but name received too late for publication in last volume of Proceedings.

Ramaley, Francis, Minneapolis, Minn.
Rauch, Henry, Minneapolis, Minn.
Reynolds, Charles E., New York, N. Y.
Richardson, Samuel W., Cleveland, O.
Roberts, Thomas, Churdan, Ia.
Roberts, William, New York, N. Y.
Rogers, Edward, Evansville, Ind.
Schmidt, Joseph H., Omaha, Neb.
Sellers, Walter S.. New York, N. Y.
Shimer, Miles H., Philadelphia, Pa.
Simmons, Frank B, Woonsocket, R. I.
Slaughter, Philip M., Richmond, Va.
Sohrbeck, George W., Moline, Ill.
Spaulding, George S., Alexandria, Minn.
Stange, Carl F., Mare Island, Cal.
Stearns, Frederick, Detroit, Mich.
St. Cyr, E. L. Nelvil, Aux Cayes, Hayti, W. I.
St. John, Sydney S., Lakota, N. Dak.
Stratte, Halvor A., Dawson, Minn.
Sullivan, John W., Valley City, N. Dak.
Temple, Oscar F., Fort Riley, Kan.
Thomason, Richard J., New Rochelle, N. Y.
Thompson, John, Washington, D. C.
Ulm, Albert G., Cavalier, N. Dak.
Walerius, Mathias, St. Louis, Mo.
Walts, David Y., League Island, Pa.
Wanous, Josephine A., Minneapolis, Minn.
Wetterstrœm, Theodore D., Cincinnati, O.
White, Herbert E., Jamestown, N. Dak.
Whitney, Edgar F., Warren, Minn.
Wilson, John M., Groveton, N. H.
Wittich, Matthew H., Minneapolis, Ind.
Wood, John W., Newport, R. I.
Woods, Charles H., Louisville, Ky.

LIST OF LIFE MEMBERS.

PUBLISHED IN ACCORDANCE WITH RESOLUTIONS OF THE COUNCIL.

SEE PROCEEDINGS 1888, PAGE 41.

[Names of Life Members under the Old Constitution in *Italics;* under the present By-Laws, in SMALL CAPITALS.]

Abernethy, Maxwell.
BAUER, LOUIS G.
BAYLEY, AUGUSTUS R.
Berrian, Geo. W.
BIROTH, HENRY.
Blatchford, Eben.
BORING, EDWIN M.
BUCK, JOHN.
Bullock, Charles.
CALDER, ALBERT L.
CANDIDUS, PHILIP C.
CANNING, HENRY.
COOMBS, CHARLES E.
Cummings, Henry T.
Dearborn, George L.
DOHME, LOUIS.
Doliber, Thomas.
DRAKE, JOHN R.
DRURY, LINUS D.
Dupuy, Eugene.
EBERT, ALBERT E.
Eckford, Joseph W.
ELLIOTT, HENRY A.
Ellis, Evan T.
FOUGERA, EDMUND C. H.
FULLER, OLIVER F.
Gale, Edwin O.
Gale, William H.
Goodwin, Wm. W.
Gordon, Wm. J. M.
Grahame, Israel F.
GROSSKLAUS, JOHN F.
HANCE, EDWARD H.
HARLOW, NOAH S.
Haviland, Henry.
HEINITSH, CHARLES A.
Heintzelman, Joseph A.
Heyl, James B.
HOLZHAUER, CHARLES.
Hudnut, Alexander.
JACQUES, GEORGE W.
Jenks, Wm. F.
Jesson, Jacob.
Kent, Robert R.
KING, JAMES T.
KLUSSMANN, HERMANN.
LAND, ROBERT H.
LEE, JAMES A.
Leitch, Arthur.
LEMBERGER, JOSEPH L.
LLEWELLYN, JOHN F.
McConville, Thomas A.
McPherson, George.
Mellor, Alfred.
MEYER, CHRISTIAN F. G.
MILHAU, EDWARD L.
MILLER, ADOLPHUS W.
Moffit, Thomas S.
Moith, Augustus T.
Molwitz, Ernest.
MOORE, GEORGE.
MOORE, JOACHIM B.
Newman, George A.
Ollif, James H.
ORNE, JOEL S.
OWENS, RICHARD J.
Patten, I. Bartlett.
Peabody, William H.
Perot, T. Morris.
PETTIT, HENRY M.
PFINGST, FERDINAND J.
Plummer, David G.
Rano, Charles O.
RAMSPERGER, GUSTAVUS.
REMINGTON, JOSEPH P.
Rittenhouse, Henry N.

ROBINSON, JAMES S.
Rollins, John F.
ROSENGARTEN, MITCHELL G.
Russell, Eugene F.
SANDER, ENNO.
SAUNDERS, WILLIAM.
SEABURY, GEORGE J.
Sharp, Alpheus P.
SHEPPARD, SAMUEL A. D.
SHINN, JAMES T.
SIMMS, GILES G. C.
SLOAN, GEORGE W.
Snyder, Ambrose G.
SQUIBB, EDWARD R.
STACEY, BENJAMIN F.
STEELE, JAMES G.
Sweeney, Robert O.
Taylor, Alfred B.
Thompson, William B.
TUFTS, CHARLES A.
Vernor, James.
Wardell, Robert C.
Warner, William R.
WAUGH, GEORGE J.
WELLCOME, HENRY S.
WHITE, AARON S.
WHITFIELD, THOMAS.
WHITNEY, HENRY M.
Wiegand, Thomas S.
WILSON, BENJAMIN O.
WINKELMANN, JOHN H.
WINTER, JONAS.
WOLTERSDORF, LOUIS.
YORKSTON, MATTHEW M.

GENERAL INCORPORATION LAW FOR THE DISTRICT OF COLUMBIA.

SECTIONS APPLICABLE TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

CLASS 3, SOCIETIES, BENEVOLENT, EDUCATIONAL, ETC.

SEC. 545. Any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign, and acknowledge before any officer authorized to take acknowledgment of deeds in the District, and file in the office of the Recorder of Deeds, to be recorded by him, a certificate in writing, in which shall be stated:

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized, not exceeding twenty years.

Third. The particular business and object of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

SEC. 546. Upon filing their certificate, the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents; and may take, receive, hold and convey real and personal estate necessary for the purposes of the society as stated in their certificate.

SEC. 547. Such incorporated society may annually, or oftener, elect from its members its trustees, directors, or managers, at such time and place, and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business; and whenever any vacancy shall happen among such trustees, directors, or managers, the vacancy shall be filled in such manner as shall be provided by the by-laws of the society.

SEC. 548. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including societies formed for mutual improvement, may, by conforming to the requirements herein, re-incorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so re-incorporated or continued.

SEC. 549. Such corporations may sell and dispose of any real estate they may acquire by purchase, gift, or devise, as follows: whenever any lot purchased for the use of the corporation, or any building erected thereon, shall become ineligible for the uses for which the lot was purchased or the building erected, to be determined by a vote of two-thirds of the shares of the stock of the corporation or the members of the corporation, at a meeting of the stockholders, or corporators, or members specially called for that purpose, the proceedings of which meeting shall be duly entered in the records of the

corporation; said lot or building may be sold, and the proceeds thereof may be vested in another lot, or in the erection of another building, or both.

SEC. 550. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock held by the stockholders, or three-fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or corporators or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

SEC. 551. No corporation acting under the six preceding sections shall hold real estate more than five years, except so much as shall be necessary for the purposes named in its certificate.

SEC. 552. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the Recorder of Deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

Approved 5 May, 1870, c. 80, v. 16, pp. 98–116—Revised Statutes of the United States, relating to the District of Columbia.

CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, we, the undersigned, desire to form an association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

First, The corporate name of the association is the American Pharmaceutical Association.

Second, This association shall continue until dissolved by the action of its members, or by the operation of law.

Third, The objects and business of said Association are as follows:

a. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

b. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

c. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

d. To regulate the system of apprenticeship and employment, so as to prevent, so far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

e. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

f. To uphold standards of authority in the education, theory and practice of Pharmacy.

g. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

Fourth. The concerns and affairs of the Association shall be managed by a Council, which shall consist for the first year of John U. Lloyd, Maurice W. Alexander, Alexander K. Finlay, Karl Simmon, Samuel A. D. Sheppard, John M. Maisch, James Vernor, C. Lewis Diehl, William H. Rogers, William Saunders, Albert E. Ebert, Philip C. Candidus, George W. Kennedy, Albert H. Hollister, James M. Good, Lewis C. Hopp and William Dupont.

Given under our respective hands and seals this 12th day of December, A. D. 1887.

Signed:	JOHN U. LLOYD,	MAURICE W. ALEXANDER,
	ALEX. K. FINLAY,	KARL SIMMON,
	SAMUEL A. D. SHEPPARD,	JOHN M. MAISCH,
	JAMES VERNOR,	C. LEWIS DIEHL,
	WILLIAM H. ROGERS,	WM. SAUNDERS,
	ALBERT E. EBERT,	PHILIP C. CANDIDUS,
	GEORGE W. KENNEDY,	ALBERT H. HOLLISTER,
	JAMES M. GOOD,	LEWIS C. HOPP,
		WILLIAM DUPONT.,
Members of the Council,		
And	JOHN A. MILBURN,	G. G. C. SIMMS,
	E. B. BURY,	Z. W. CROMWELL,
	W. S. THOMPSON,	JOHN R. MAJOR,
	CHARLES CHRISTIANI,	W. G. DUCKETT,
	A. J. SCHAFHIRT,	GEO. W. BOYD,
	O. H. COUMBE,	HENRY A. JOHNSTON,
	GEO. B. LOCKHART,	W. C. MILBURN,
	T. C. MURRAY,	ARTHUR NATTANS,
	JOSEPH R. WALTON,	THOMAS M. WEHRLY,

of the District of Columbia.

(Notaries' certificates attached to the original document attest the genuineness of each and every signature.)

Received for Record February 21st, 1888, at 1:05 P. M., and recorded in Liber No. 4, fol. 302, Acts of Incorporation, District of Columbia, and examined.

Signed: JAMES M. TROTTER, *Recorder.*

SEAL:
Office of Recorder of Deeds,
District of Columbia,
Washington, D. C.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore.*

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may ake the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary of $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of twenty-one members, nine of whom, selected from such members as have had at least three years' membership in this Asso-

ciation, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council. The Secretary may or not be a member of the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

CHAPTER VII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that no one, whose name has been dropped from the roll for non-payment of dues, shall be eligible for membership until payment has been made of the three years' dues for which he is in arrears.

ARTICLE II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and post the name in some suitable place in the meeting hall, near the beginning of a session: objection, if any, to be made in writing, to the Secretary of the Council, previous to the Association taking any action on the proposition. Near the close of the same, or at a subsequent session, the Association may, by vote, elect such person a member, after which his membership shall be completed by his signing the Constitution and By-Laws, and paying the annual dues for the current year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *three successive years* he may be dropped from the Roll.

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER VIII.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, three Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Pharmaceutical Legislation and Education.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. The fourth, fifth and sixth sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VII. At the seventh, eighth and ninth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VIII. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE IX. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE X. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XI. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 7. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

Section 8. A committee of five on time and place of meeting shall be appointed by the President at the first session, to report at the second session.

Section 9. Incidental business.

ARTICLE XII. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the persons nominated shall be balloted for.

Section 4. The Council shall present names of persons recommended for membership.

Section 5. Reports of Standing Committees shall be read.

Section 6. Reports of Special Committees shall be read.

Section 7. Incidental business.

ARTICLE XIII. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XIV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XV. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVI. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER IX.

Of Committees.

ARTICLE I. There shall be appointed or elected seven Standing Committees as follows: a Committee on Commercial Interests, a Committee on the Revision of the Pharmacopœia, and a Committee on Pharmaceutical Legislation and Education, each to consist of five members; a Committee on Scientific Papers, a Committee on the Ebert Prize, a Committee on General Prizes, each to consist of three members; and a Committee on Transportation, to consist of ten members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person preparing a paper for the Association which will require more than ten minutes for its reading, must accompany the same with a synopsis which can be read within ten minutes' time. The paper and synopsis must both be furnished the Committee of the particular Section to which it refers, previous to the first session.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, within six months after the annual meeting at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE VIII. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice,

and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE IX. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the Local Secretary, who shall be a member of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. Unless otherwise specially arranged for by the Committee, the Chairman of this Committee shall be the member residing nearest to the place of meeting.

CHAPTER X.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $50.

ARTICLE II. He shall post in a conspicuous place in the meeting-room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

ARTICLE IV. The Secretary of the Committee shall receive an annual salary of $150.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:

a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

SECTION ON COMMERCIAL INTERESTS.

ORDER OF BUSINESS.

1. Calling the Section to order.
2. Reading of the Chairman's Address.
3. Reports of Committees.
4. Reading of Papers.
5. New Business and Discussion.
6. Nomination and Election of Officers for the ensuing year.
7. Installation of Officers.
8. Reading of the Minutes.
9. Adjournment.

SECTION ON SCIENTIFIC PAPERS.

ORDER OF BUSINESS.

FIRST SESSION OF THE SECTION.

1. Calling the Section to order.
2. Reading of the Chairman's address.
3. Reports of Committees, if there be any to make, and appointment of such new Committees as may appear desirable.
4. Nominations (but not elections at this sitting) for the new officers of the Section. The names of members nominated to be posted in the hall on the adjournment of this session. The election not to take place until after the opening of the next session, when further nominations may also be made if it is deemed desirable.
5. Reading of Papers and discussions on the subjects brought up.
6. Adjournment.

SECOND SESSION OF THE SECTION.

1. Reading of Minutes of the previous Session.
2. Election of New Officers for the ensuing year.
3. Reports of Committees—Incidental Business.
4. Reading of Papers and Discussion.
5. Adjournment.

THIRD SESSION OF THE SECTION.

1. Reading of Minutes of the previous Session.
2. Reading of Papers and Discussion.
3. Reports of Committees.
4. Installation of Officers.
5. New Business.
6. Reading of Minutes.
7. Final Adjournment.

SECTION ON EDUCATION AND LEGISLATION.

ORDER OF BUSINESS.

FIRST SESSION OF THE SECTION.

1. Calling the Section to Order.
2. Reading of the Address of the Chairman.
3. Reports of Committees.
4. Nominations of Officers for the ensuing year. The election to take place at the opening of the second session.
5. Reading of Papers and Discussion.
6. Adjournment.

SECOND SESSION OF THE SECTION.

1. The Reading of Minutes of the previous Session.
2. The Election of Officers.
3. Reports of Committees—Incidental Business.
4. Reading of Papers and Discussion.
5. Adjournment.

THIRD SESSION OF THE SECTION.

1. The Reading of Minutes of the previous Session.
2. Reading of Papers and Discussion.
3. Reports of Committees.
4. Installation of Officers.
5. New Business.
6. Reading of Minutes.
7. Final Adjournment.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Auditing Committee, at the same time and place, the bonds, saving-bank books, and accounts of the same that may be in his hands.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council.

FORM OF APPLICATION FOR MEMBERSHIP.

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-laws, I hereby signify my approval of the same, and subscribe to them. I also enclose the annual contribution, five dollars, for the first year of my membership.

Name in full..

Number and Street..

Town and State..

Recommended by the undersigned two members in good standing:

....

....

FORMS OF PROPOSITIONS AND OF COMPLETING MEMBERSHIP IN ACCORDANCE WITH CHAPTER VII., ARTICLE II., OF THE BY-LAWS.

THE undersigned members in good standing, being personally acquainted with the following persons eligible to membership in accordance with Chapter VII., Article II. of the By-Laws, testify to their moral character, their skill as practical druggists and pharmacists, and their professional probity and good standing, and they recommend them for membership in the American Pharmaceutical Association.

NAMES OF CANDIDATES. ADDRESS.

Proposed by...... ....

....

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them, and enclose the annual contribution, five dollars, for the current year.

Name in full..

Date..

Address.................... ....

....

To be sent to Geo. W. Kennedy, Secretary of the Committee on Membership Am. Ph. Assoc., Pottsville, Penn.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. De Meyer, *Brussels*, 1868.

Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.

Michael Carteighe, *London*, 1882.

Joseph Ince, *London*, 1882.

Richard Reynolds, *Leeds*, 1882.

Thomas Greenish, *London*, 1882.

FRANCE.

Dr. G. Planchon, *Paris*, 1877.

GERMANY.

Dr. G. Dragendorff, *Rostock*, 1868.

Dr. Edward Schaer, *Strassburg*, 1877.

Dr. Carl Schacht, *Berlin*, 1882.

NETHERLANDS.

Dr. J. E. De Vrij, *The Hague*, 1871.

RUSSIA.

Dr. J. von Martenson, *St. Petersburg*, 1882.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPS. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

Auburn.

Miller, Emerson Romeo 1895

Mobile.

Brown, Albert Edward 1887
CANDIDUS, PHILIP CHARLES 1857
La Grange, John Van Nuys 1897
Mohr, Charles 1871
Punch, William Francis 1874
Smith, Thomas Edmond 1894
Van Antwerp, Andrew 1890
Van Antwerp, Garet 1880

Montgomery.

Andrew, Edgar Cecil 1895
Dent, Warren Fillmore 1895
Knabe, Gustavus Alexander 1876

Selma.

Galt, Edward Pegram 1883

ARIZONA.

Phœnix, Maricopa Co.

Eschman, Clemens Louis 1889
Furl, Irwin William 1894
Hudson, Taliaferro Flournoy 1894

Prescott.

Brisley, Harry 1894

ARKANSAS.

Batesville.

Fletcher, John Wade 1894

Camden.

Morgan, Aylmer Lee 1890

Diamond P. O.

Laird, John 1895

Forrest City.

Webb, David Crawford 1896

Fort Smith.

Morton, John Walker 1894
Sparks, James Mitchell 1894

Helena.

King, Robert Bruce 1896

Hot Springs.

Klein, Ernest Frederick 1894

Little Rock.

Bond, John Barnitz 1883
Dowdy, Joseph Franklin, Jr. 1894
Jungkind, John August 1887

Lonoke.

Airheart, Israel Burt 1896

Pine Bluff.

Anderson, James McPhuter 1893
Dewoody, William Lawrence 1887
Valliant, George Enos 1891

Pocahontas.

Skinner, William Henry 1894

Russellville.

Kerr, William Whitman 1887

Searcy.

Robertson, Felix Otey 1890

Van Buren.

Kerr, Frank Gault 1890

Walnut Ridge.

Wilson, John Edgar 1896

CALIFORNIA.

Benicia Barracks.

Miller, Herman 1897

Centreville, Alameda Co.

Lernhart, August 1889

Fruit Vale, Alameda Co.

Neppach, Stephen Alfred........... 1889

Los Angeles.

Kirkland, Derwentwater 1889

Mare Island.

Stange, Carl Frederick 1897

Monrona.

Marshall, Rush Porter............... 1893

Napa.

Levinson, Joseph 1895

Oakland.

Flint, George Benjamin............. 1889

Ontario.

Jesson, Jacob 1872

Oroville, Butte Co.

Ekman, Nils Adolf 1889

Pasadena.

Bley, Alphonso Albert Willetts 1889

Sacramento.

Helke, William Ludwig 1889
Ray, Frederick Edwards............. 1889

San Francisco.

Argenti, Jerome John Baptiste 1893
Bayly, Charles Alfred 1889
Calvert, John 1870
Dawson, John Henry 1882
Esters von Krakau, James Henry William 1897
Grossman, Edward Lorenzo.......... 1893
Joy, Edwin Wolcott................. 1882
Kelley, Charles Maurice 1897
Moffit, Thomas Sebatier 1861
Pearson, Joseph Frederick 1897
Schmidt, Valentine 1887
Searby, William Martin 1882
STEELE, JAMES GURDEN 1859
Weihe, Otto Albert 1893
Wenzell, William Theodore 1870
White, Richard Edward 1889

Santa Clara.

Oberdeener, Samuel 1889

Santa Monica.

Devine, John 1887

Vacaville.

Miller, James Monroe............... 1889

Vallejo, Solano Co.

Topley, James...................... 1869

COLORADO.

Central City.

Best, John......................... 1866
Davies, Llewellyn Powell 1891

Colorado Springs.

Ward, Augustus Jae 1893

Cripple Creek.

Black, John Reid................... 1891

Denver.

Beitenman, William Wallace 1888
De Graffe, Bertha Leon............. 1895
Depeyre, Louis Nolël 1894
Ford, Charles Mangan 1887
Hover, William Adgate 1895
Huecker, John 1891
Kochan, John...................... 1888
Lord, Frank Jotham 1889
McCrea, Harry Francis.............. 1895
Naly, Sarah Lusan 1895
Scholtz, Edmund Louis.............. 1881
Steinhauer, Frederick 1881
Walbrach, Arthur................... 1881
Ward, Charles Edward 1895

Fort Collins.

Scott, Alexander Wear 1893

Glenwood Springs, Garfield Co.

Ewing, Frederic Charles 1889

Leadville.

Taylor, George Edward.............. 1895

Longmont.

Turrell, Judson Wade 1893

Lyons.

Crona, Sixtus Edward Seine......... 1885

Manzanola.

Clowes, William Legh..............1895

Pueblo.

Cambier, Jacob....................1895
Wells, Charles Horton..............1893

COLUMBIA, DISTRICT OF.

Washington.

Boyd, George Washington 1883
Bradbury, Wymond Henry..........1895
Christiani, Charles 1874
Criswell, Francis McClure...........1892
Duckett, Walter G. 1876
Easterday, Herbert Clifton..........1893
Eppley, James Kerr.................1895
Flemer, Lewis......................1895
Henry, Charles Landon 1893
Henry, Frank Clinton 1894
Herbst, William Parker 1895
Hilton, Samuel Louis 1890
Hurlebaus, George William 1895
Hutton, Harry Dubant 1891
Johnston, Henry Augustus...........1883
Koch, John Adolph..................1896
Major, John Richards 1873
Martin, John Charles................1883
May, Edward 1897
Mulcahy, Daniel Domnick 1895
Nattans, Arthur 1883
Schafhirt, Adolph Julian............1876
SIMMS, GILES GREEN CRAYCROFT 1860
Thompson, John 1897
Thompson, William Scott...........1871

CONNECTICUT.

Ansonia.

Smith, Samuel Wheeler 1889

Bridgeport.

Fisher, Elbert Ellsworth 1892

Hartford.

Chapin, Frederick Hastings.........1880
Edwards, Frederick Bulkeley........1894
Newton, Philo Woodhouse..........1892
Rapelye, Charles Andrew...........1876
Shannon, Thomas Ross Alvin 1892
Stoughton, Dwight George..........1890
Tracy, David Wallace 1892
Williams, John Kirby 1875

Jewett City.

Chabot, David Pierre................1895

Meriden.

Mosher, William Wooster...........1894

Middletown.

Pitt, John Richard..................1872

Naugatuck.

May, James Oscar 1875

New Britain.

Perkins, Charles William 1892

New Haven.

Dimock, Robert Hemphill 1889
Eagny, James Thomas...............1894
Gessner, Emil Adolph..............1878
Hogan, John Joseph 1890
Mix, Willis Lee 1896
Spalding, Warren Alphonso.........1876
Sperry, Herman Jay.................1880
Wood, Alonzo Felton, Jr..... 1890
Wood, James Prior 1890

New London.

Cowan, John.......................1897
Nichols, John Cutter 1886

Noank, New London Co.

Miner, Orrin Eugene................1894

Norwich.

Duggan, James.....................1894
Osgood, Hugh Henry 1875
Sevin, Nathan Douglas 1875

Putnam.

Dresser, George Edward 1886

Thomaston.

Williams, Charles Fish 1888

Thompsonville, Hartford Co.

Smith, Edward Newton.............1885
Steele, George Robert..............1892

Waterbury.

Woodruff, Roderick Samuel.........1876

Willimantic.

Wilson, Frank Milton...............1883

DELAWARE.

Wilmington.

Belt, Zedekiah James 1876
Collins, Edward Smith..............1897
Smith, Linton........ 1870
Watson, Herbert Kennedy..........1888

FLORIDA.

Apopka, Orange Co.

Kent, Robert Restieaux 1855

De Land.

Fisher, George Washington 1893

Fort George.

Rollin, John Francis 1859

Jacksonville.

Aird, William 1887
Crum, John Darius 1892
Kirk, James Edgar 1896

Key West.

DeArmona, Joseph Raymond 1893
Kolb, William Walter 1897

St. Augustine.

Smith, Lauriston Stephen 1892
Woodman, Walter Irving 1893

Tampa.

Leonardi, Sydney Beauregard 1890

Titusville, Brevard Co.

Dixon, John Marion 1894

GEORGIA.

Americus.

Murray, Emmett Leroy 1894

Atlanta.

Avary, Moody Burt 1892
Cronheim, Solomon 1892
Dunwody, Richard Gaillard 1891
Freeman, William Benjamin 1894
Jacobs, Joseph 1894
Payne, George Frederick 1893
Sharp, Harry 1890
Watson, Sidney Powell 1887

Augusta.

Durban, Sebastian Charles 1883
LAND, ROBERT HENRY 1859
Smith, James Perrin 1894

Bowdon.

Lovvorn, James Lewis 1897

Brunswick.

Joerger, Frederick 1896

Fitzgerald.

Hall, Nettie Crabbe 1893

Greenville.

Tigner, James Ogletree 1890

La Grange.

Slack, Henry Richmond, Jr. 1890

Macon.

Brunner, Norman Isaac 1878
Cheatham, Thomas Alexander 1890
Ingalls, John 1876
King, Campbell Thomas 1897
Lamar, Henry James 1897

Rome.

Curry, David W. 1894
Trevitt, Cleophas Aristobolus 1896

Savannah.

MacDonald, Allan Douglas 1895
Offutt, Willard Chase 1896
Rowlinski, Robert Antone 1892
Solomons, Isaiah Abram 1894

Summerville.

Arrington, Homer Houston ... .1892

Thomasville.

Thomas, Robert, Jr. 1888

IDAHO.

Emmett.

Smithson, David Elmer 1890

Mountain Home.

Davison, James 1895

ILLINOIS.

Aurora.

Staudt, Louis Carl 1890

Bradford, Stark Co.

Plummer, David Gorham 1869

Cairo.

Schuh, Paul Gustav 1894

Camp Point, Adams Co.

Bartells, George Case 1881

Carlinville, Macoupin Co.

Loehr, Theodore Christian 1888

Chicago.

Bartlett, Nicholas Gray 1864
Behrens, Emil Christian Louis 1893

Behrens, Paul Johannes Heinrich....1888
BIROTH, HENRY 1865
Bishop, Samuel Edward 1890
Bodemann, Wilhelm 1887
Bronson, George Styles 1893
Button, Charles Edwin 1881
Conrad, John 1887
Davoll, David Lake, Jr. 1897
Day, William Baker................1895
Dorner, Emil August 1892
EBERT, ALBERT ETHELBERT 1864
Fischer, Oscar Frederick............1892
Fleischer, Adolph Theodore.........1888
Frerkson, Richard Christopher 1888
FULLER, OLIVER FRANKLIN 1869
Gale, Edwin Oscar................1857
Gale, William Henry..............1857
Grassly, Charles William............1884
Gray, William 1892
Hallberg, Carl Swante Nicanor 1879
Hartwig, Charles Ferdinand 1881
Hartwig, Otto Julius 1892
Heddens, Claus Heising 1893
Hereth, Franklin Samuel 1893
Hogey, Julius Henry 1880
Kirchgasser, William Charles........1888
Klein, Frederick...................1893
Klotz, August Edward...........1895
Lehman, Louis....................1895
Lord, Thomas.....................1882
Lundberg, John Christian 1892
Maguire, Andrew Herman Jos. McBurney 1896
Matthews, Charles Edwards 1893
McMonies, Thomas Little 1897
Miner, Maurice Ashbel 1880
O'Gorman, Theophilus Vincent 1897
Oldberg, Oscar 1873
Parsons, John 1865
Patterson, Theodore Henry 1869
Pattison, George Henry 1893
Porter, Millett Nathan..............1892
Puckner, William August 1888
Rhode, Rudolph Ernst 1887
Sargent, Ezekiel Herbert 1864
Scherer, Andrew 1884
Schmidt, Florian Charles 1882
Schmidt, Frederick Michael 1887
Scott, J. McDonald 1892
Sempill, Walter Morrison 1892
Truax, Charles 1882
WHITFIELD, THOMAS 1865
WOLTERSDORF, LOUIS..............1865
Wooten, Thomas Victor 1893
Zahn, Emil Augustus...............1881

Du Quoin.

Carr, Jerome Carroll 1895

East St. Louis.

Knoebel, Thomas...............1892

Geneseo.

Stamm, Dante Milton 1896

Hanna City.

Davis, Samuel Charles..............1893

Highland.

Mueller, Adolphus..................1871

Kankakee.

Rogers, Henry Horace 1895

Moline.

Lindvall, Charles Gustaf 1897
Sohrbeck, George Henry............1888
Sohrbeck, George William 1897

Mt. Vernon.

Morse, Edward Worth..............1896

North Alton.

Barth, George Fred.................1896

Pekin.

Ehrlicher, Henry Michael 1892

Peoria.

Benton, Wilber Merritt 1888
Heschong, John Frederick..........1896
Lueder, Fritz.......................1894
Vonachen, Frank Herman...........1895
Zimmermann, Albert 1893
Zimmermann, Charles 1881

Peru, La Salle Co.

Danz, Martin 1895

Pontiac.

Murphy, John Spence 1896

Rock Island.

Wyckoff, Elmer Ellsworth Ai........1894

Streator.

Higby, William Herbert............1892

Stronghurst, Henderson Co.

Harter, Isaac Foster 1893

Vienna.

Simpson, William Calvert............1895

INDIAN TERRITORY.

Eufaula.

Moore, Charles Gates..............1892

Red Fork.

Clinton, Frederick Severs............1897

Vinita.

Campbell, Marion J................1897

Wynnewood.

Hillebert, George Allen.............1894

INDIANA.

Bourbon.

Weiser, William Augustus..........1894

Columbus.

Stahlhuth, Ernst Henry William ... 1887

Evansville.

Rogers, Edward...................1897
Schlaepfer, Henry John.............1879

Fairmount.

Beasley, William Alexander.........1894

Garrett.

Stoehr, Julius John................1894

Indianapolis.

Carter, Frank Henry...............1891
Dill, Josiah Byron.................1878
Eads, Robert Isom.................1895
Eichrodt, Charles William..........1892
Field, Claud.......................1890
Frauer, Herman Emanuel...........1881
Huder, Henry J....................1894
Hurty, John Newell................1882
Leist, Jacob Lawrence..............1881
Lilly, Eli..........................1878
Lilly, Josiah Kirby.................1890
Pfafflin, Henry Adolph..............1892
SLOAN, GEORGE WHITE.............1857
Zimmer, Harry Edgar...............1892

Jeffersonville.

Loomis, John Clarence.............1876

La Porte.

Meissner, Frederick William, Jr......1890

Muncie.

Nickey, Frank Birch................1895

New Albany.

Knoefel, Bruno....................1896
Knoefel, Charles Deitrick...........1894

South Bend.

Eliel, Leo.........................1882
Meyer, Martin Monroe..............1897

Terre Haute.

Baur, Jacob........................1879

Warren.

Hickerson, William Henry...........1894

IOWA.

Britt.

Carton, John Arthur................1895

Charles City.

Legel, John Gotthelf................1897

Churdan.

Roberts, Thomas..................1897

Clear Lake.

Etzel, John Leonhardt..............1897

Clinton.

Majer, Oscar......................1880

Davenport.

Ballard, John Winthrop.............1871
Harrison, Jacob Hugh..............1883

Des Moines.

Howard, Fletcher..................1895
Macy, Sherman Riley...............1891
Ward, Milo Woodruff...............1895

Dubuque.

Hervey, James.....................1892
Ruete, Theodore William...........1870
Torbert, Willard Horatio............1887
Wittmer, Joseph Washington, Jr.....1896

Fort Dodge.

Oleson, Olaf Martin................1877

Fort Madison.

Schafer, George Henry.............1871

Garner.

Collins, Carrie Smith...............1895

Iowa City.

Boerner, Emil Louis 1877

Keokuk.

Kiedaisch, John Frederick, Jr.........1893

Lost Nation.

McMeel, James Henry...............1895

Mason City.

Burns, Edwin Miller 1897

Muscatine.

Braunwarth, Alice Louisa...... 1892

Oskaloosa.

Pickett, John Harvey 1887

Sioux City.

Arnold, Charles Frederick 1891
Crady, Edward Edmond.............1892
Moore, Silas Harwood 1880
Scherling, Gustav..... 1884

Stuart.

Treat, Joseph Augustus..............1885

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Argentine.

McGeorge, William.................1895

Atchison.

Noll, Mathias 1891
Tomlinson, Burton Amos 1895

Fort Riley.

Temple, Oscar Fitzhugh 1897

Gypsum City, Saline Co.

Schmitter, Jonathan 1892

Hiawatha.

Miner, Mary Olds 1892

Hillsboro.

Entz, Jacob John...................1895

Hutchinson.

Ardery, Lorimer....................1895

Lawrence.

Hamlin, James Alpheus 1895
Leis, George.......................1869
Moore, John Thomas...............1888
Sayre, Lucius Elmer 1883
Woodward, Brinton Webb...........1895

Leavenworth.

Mehl, Henry William 1892

Marysville.

Ault, Edward Abbott 1895

Ottawa.

Becker, Charles Louis...............1892

Topeka.

Merrell, Ashbel Hill 1884
Washburn, Harry Monroe 1890

Wichita.

Hettinger, Howard Huyett...........1894

KENTUCKY.

Covington.

Belt, James Ferris 1892
Pieck, Edward Ludwig 1887
Zwick, George Albert 1874

Flemingsburg.

Reynolds, John Jefferson 1876

Frankfort.

Averill, William Henry... 1874
Gayle, John William 1891

Henderson.

McFarland, Robert Mumford........1893

Louisville.

Beckmann, Oscar Albert............1879
Diehl, Conrad Lewis 1863
Dilly, Oscar Charles................1888
Dimmitt, Addison 1895
Jones, Simon Newton 1870
Mueller, Otto Edward..............1888
Newman, George Abner 1866
Overstreet, William Payne 1893
Peter, Minor Cary 1894
Peyton, Robert Docker 1887
PFINGST, FERDINAND JOHN 1867
Renz, Frederick Jacob 1883
Scheffer, Emil......................1872
Schliemann, Edward Bernard........1880
Schoettlin, Albert John 1882
Snyder, Robert Johnson 1887
Thieman, John Henry, Jr. 1896
Troxler, Constantine, Jr. 1896
Votteler, William...................1895
Woods, Charles Henry Albert 1897

Shelbyville.

Preissler, Henry Webber 1893

Somerset.

Porter, Chilton Scott 1882

Taylorsville.

Rogers, Wiley 1874

Uniontown.

Hardigg, William Leopold 1881

LOUISIANA.

Bayou Goula.

Viallon, Paul Louis 1870

Hammond.

Brewer, John Weems 1893

New Iberia.

Lee, Charles Hill 1891
LEE, JAMES AUGUSTIN 1856

New Orleans.

Capdau, Pierre August 1895
Chalin, Louis Fisk 1887
Dejan, John Baptist George 1891
Finlay, Alexander Kirkwood 1883
Godbold, Fabius Chapman 1887
Grambois, Augustin 1891
Hubert, Ernest 1891
Kaczoroski, Adolph Onesime 1895
Keppler, Christian Lewis 1882
Legendre, Joseph Amilcar 1891
Levy, William Michael 1894
Lyons, Isaac Luria 1875
May, Eugene 1891
Metz, Abraham Lewis 1887
Meyer, Alfred 1896
Miller, Charles 1897
Otto, John Nicholas Washington 1891
Quayle, Thomas Andrew 1897
Roux, Nemours Peter 1895
Taylor, Walter Thomas 1891
Tuma, Bruno Ottokar Camillo 1891
Wunderlich, Edward 1891

Plaquemine.

Hiriart, Sebastian 1891

Port Allen.

Charroppin, Emile Lafond 1891

St. Joseph.

Kershaw, John Pearis 1895

MAINE.

Auburn.

Burrill, John Walter 1896
Robinson, William Allen 1892

Augusta.

Partridge, Charles Kimball 1867
Partridge, Frank Reuben 1895

Bangor.

HARLOW, NOAH SPARHAWK 1859
Sweet, Caldwell 1881

Bath.

Anderson, Samuel 1876

Belfast.

Moody, Richard Henry 1876

Biddeford.

Boynton, Herschel 1875

Ellsworth.

Parcher, George Asa 1875

Lewiston.

Lowell, Edward Mark 1896
Moulton, Daniel Pierce 1891

Machias.

Crane, Frank Trussel 1894

Pittsfield.

Libby, Henry Fitzgerald 1882

Portland.

Cogan, Denis Stephen 1896
Drew, Walter Israel 1896
Earl, Noble Clarkson 1894
Frye, George Carlton 1879
Goold, Joseph Edwin 1896
Hay, Edward Allston 1889
Heseltine, Daniel Wilber 1896
McClearn, Henry Trefethen 1896
Perkins, Benjamin Abbott 1878
Schlotterbeck, Augustus George 1896

Saco.

Sawyer, Charles Henry 1896

Sanford.

Wingate, Frank Holman 1896

South Windham.

Rand, Daniel Moulton 1892

Waterville.

Dorr, George Watson 1896

Woodfords.

Parks, John Kimball 1896

MARYLAND.

Baltimore.

Brack, Charles Emil 1876
Burrough, Horace 1883
Caspari, Charles, Jr. 1883
Culbreth, David Marvel Reynolds 1883
Davis, John Alexander 1894
Dohme, Alfred Robert Louis 1891
Dohme, Charles Emile 1863
DOHME, LOUIS 1859
ELLIOTT, HENRY ALEXANDER 1859
Emich, Columbus Valentine 1863
Foster, James Webb 1894
Frames, John Fuller 1890
Gilpin, Henry Brooke 1889
Gosman, Adam John 1870
Hancock, John Francis 1863
Hancock, John Henry 1870
Hynson, Henry Parr 1890
Mebane, Robert Sloan 1894
Muth, George Louis 1894
Nordmann, Herman 1895
Quandt, Arthur Albert 1894
Quandt, Ernest Edmund 1894
Richardson, Thomas Leonard 1895
Russell, Eugene James 1856
Schulze, Louis 1892
Sharp, Alpheus Phineas 1855
Simon, William 1885
Smith, Theodric 1890
Thomsen, John Jacob 1883
Vellines, Davies 1895
Westcott, James Walling 1890
WINKELMANN, JOHN HENRY 1864

Chestertown.

Stam, Colin Ferguson 1882

Cumberland.

Hermann, John George 1878
Shryer, Thomas Wilson 1875

Frederick City.

Schley, Steiner 1878

Hagerstown.

Mumma, Daniel Edgar 1897
WINTER, JONAS 1863

Snow Hill.

Powell, William Cottingham 1895

MASSACHUSETTS.

Athol.

Burton, William Arthur 1896
Hobbs, William 1892

Boston.

Baird, Julian William 1894
Bassett, Charles Harrison 1867
Boyden, Edward Cleveland 1874
Breck, Frederick Walter 1897
Burnham, Alfred Augustus, Jr. 1891
CANNING, HENRY 1865
Capper, William Ernest 1892
Chapin, William Arms 1880
Colton, James Byers 1865
COOMBS, CHARLES EVERETT 1897
Cramer, Max 1881
Doliber, Thomas 1859
DRURY, LINUS DANA 1871
Durkee, William Carley 1885
French, John Innes 1894
Gammon, Irving Parker 1891
Godding, John Granville 1875
Gorman, John Thomas Bernard 1892
Graham, Clarence Montrose 1897
Hayes, James Henry 1892
Hedley, Thomas Albert 1893
Jones, James Taber 1875
Kelley, Edward Samuel 1871
Lauricella, Felice 1896
Lewis, Ernest Grant 1892
Lowd, John Colby 1871
Markoe, George Berger 1897
McColgan, Adam Thomas 1892
Morse, Edwin Timothy 1897
Patten, Ichabod Bartlett 1858
Pierce, William Herbert 1879
Prescott, Horace Augustus 1875
Sawyer, William Frederick 1885
Scoville, Wilbur Lincoln 1891
Sharples, Stephen Paschell 1875
SHEPPARD, SAMUEL AIRUS DARLINGTON. 1865
Siegemund, Charles Augustus 1882
Smith, Linville Holton 1892
Stowell, Daniel 1875
Tilden, Amos Kendall 1892
Tucker, Greenleaf Robinson 1890
Vargas-Heredia, Jorge 1891
Varney, Edward Francis 1892
Wells, Edwin Herbert 1893
West, Charles Alfred 1892
Wheeler, William Dexter 1892

Williams, George Gorbam............1888
WILSON, BENJAMIN OSGOOD.........1859
Wood, Edward Stickney.............1879

Brockton.

Randall, Frank Otis................1893

Cambridge.

Claflin, Walter Addison 1896
Phillips, Carrie Elizabeth 1894

Cambridgeport.

BAYLEY, AUGUSTUS RAMSEY.........1859
La Pierre, Elie Henry...............1892
Laing, Alfred Allan.................1888
Norton, George Edward 1895
ORNE, JOEL STONE..................1859
Porter, Louis Fowler 1892

Charlestown.

Marshall, Ernest Clifton 1875
STACEY, BENJAMIN FRANKLIN. 1860

Chelsea.

BUCK, JOHN 1855
Buck, John Lynian 1883
Graham, Joseph Henry.............1897

Concord.

Richardson, Horatio Stillman 1892

East Weymouth.

Hoyt, George Melvin 1875

Fall River.

Riddell, Benjamin Franklin 1892

Fitchburg.

Estabrook, Henry Arthur 1886

Great Barrington.

Whiting, John Fred.................1895

Holyoke.

Ball, Charles Ely 1885
Fortier, Lawrence Hubert 1892

Jamaica Plain.

Ernst, Frank Frederick.............1891

Lawrence.

Glover, William Henry..............1891
WHITNEY, HENRY MARTIN 1859

Lee.

Pease, Francis Merrick.............1880

Lowell.

Bailey, Frederick 1869
Butler, Freeman Hall 1874
Hood, Charles Ira 1871
Robinson, Edward Augustus 1888
Thomasson, Anders.................1892

Marlborough.

Hartshorn, Frederick Arthur 1880

Melrose.

Larrabee, John.....................1897

New Bedford.

Blake, James Edwin 1866
Bunker, Elihu 1885
Shurtleff, Israel Hammond...........1875

Newburyport.

Davis, Charles Leland...............1897
Goodwin, William W. 1853

Newton.

Crowdle, John Edward...... 1894
Hudson, Arthur.....................1882
Mason, Harry Ruggles 1894

North Andover.

Berrian, George Washington 1857

Pittsfield.

Hydren, Carl 1892
Manning, John Henry...............1889

Plymouth.

Carver, Frank Hahnemann...........1891

Provincetown.

Adams, John Darrow 1892

Raynham.

Crossman, George Alvin.............1872

Rockland.

Estes, Joseph Joslyn 1870

Rockport.

Blatchford, Eben 1857

Salem.

Nichols, Thomas Boyden 1876
Price, Charles Henry................1882
Price, Joseph 1888

Shelburne Falls.

Baker, Edwin......................1875

Somerville.

Flanagan, Lewis Cass 1875

South Hadley Falls.

Benhard, Albert Henry 1894

Stoneham.

Drake, Frederick Townsley 1894
Patch, Edgar Leonard..............1872
Ward, Charles Abraham 1891

Waltham.

Lynch, Frank Kernan..............1897

Worcester.

Harris, Francis Mason 1894
Scott, George Theodore 1883

MICHIGAN.

Ann Arbor.

Eberbach, Ottmar..................1869
Mann, Albert 1889
Prescott, Albert Benjamin...........1871
Schlotterbeck, Julius Otto...........1888
Stevens, Alonzo Burdette............1885

Armada, Macombe Co.

Phillips, Edwin Freeman 1888

Corunna.

Reidy, Michael.................... 1894

Detroit.

Caldwell, James William............1875
Helfman, Joseph 1894
Lyons, Albert Byron 1885
Maguire, Eduord Sylvester 1897
Parker, Arthur Sheldon.............1891
Perry, Frederick William Riley 1885
Sherrard, Charles Cornell 1893
Stearns, Frederick.................1897
Stearns, Henry Albyn 1888
Vernor, James....................1866
Warren, William Matthew..........1889

Flushing.

Sprague, Wesson Gage 1895

Grand Rapids.

Schrouder, Benjamin 1895

Greenville.

Hall, William Alanson 1888

Ionia.

Gundrum, George 1882

Kalamazoo.

McDonald, George.................1871
Osseward, Cornelius................1897
Todd, Albert May............... ..1885

Owasso.

Parkhill, Stanley E.................1887

St. Clair City.

Ward, George James...............1893

MINNESOTA.

Alexandria.

Holverson, Henry Theophilus 1895
Spaulding, George Sumner..........1897

Anoka.

Goodrich, George Herbert .... .1895

Austin.

Dorr, Edward Clark 1895

Dawson.

Stratte, Halvor A. 1897

Duluth.

Boyce, Samuel F...................1871
Sweeney, Robert Ormsby............1866

Faribault.

Hawley, William Bentley 1895

Fergus Falls.

Axness, Ole Mikkelson 1895

Granite Falls.

Johnson, Knute Alfred 1897

Grove City.

Gayner, John Niles 1890

Heron Lake.

Kellam, Charles Roderick Judson....1895

Jackson.

Portmann, Cæsar Augustus 1897

Lake Park.

Heyerdahl, Carl Otto.... 1893

Lanesboro.

Kyseth, Bernt Olaf 1897

Minneapolis.

Allen, E. Floyd 1885
Crolius, Frank Marcelous...........1884
Danek, John Francis...............1895

Donaldson, Joseph Coddington......1893
Gamble, Stewart 1897
Griffen, Truman...................1895
Harrah, John William..............1895
Huhn, Charles Hugo................1897
Huhn, George 1884
King, George Alexander Newton. ...1892
Lariviere, Telesphore.............1896
Peterson, Johannes Otto 1895
Ramaley, Francis..................1897
Rauch, Henry 1897
Sanderson, Stephen Francis 1880
Shumpik, Edward 1895
Thompson, Albert Delano 1895
Wanous, Josephine Anna 1897
Webster, Hendrick Gordon 1895
Wittich, Matthew Henry 1897
Wulling, Frederick John...........1893

Monticello.

Lynch, Robert Fulton..............1897

New Ulm.

Eckstein, Andrew Joseph...........1895

Ortonville.

Nielson, John.....................1897

Owatonna.

Gausewitz, William John Frederick...1895

Rochester.

Qvale, Victor Asbgörn.............1889

Spring Valley.

Rohde, Claus Frederick............1885

Stillwater.

Richard, Alexander 1896

St. Paul.

Collier, William Kelly............1897
Faber, Frederick William..........1895
Frost, William Arthur.............1892
Getty, Wilmot Stevenson 1896
Hall, Alden Taylor 1895
Harding, Lawrence Arthur..........1892
Heller, Charles Tomkins...........1895
Warren, Edwin Alonzo..............1887
Zimmermann, Bernard...............1895

Wabasha.

Trautmann, Ludwig.................1893

Warren.

Whitney, Edgar Francis............1897

Wells.

Stiles, Justin Edson..............1895

Wheaton.

Mork, Thomas Karl.................1895

Willmar.

Carlson, Swan B. 1897
Elfstrum, Axel Fridolf............1897

Worthington.

Humiston, Edwin Ray, Jr. 1895

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William..........1883

Holmesville.

Girling, Robert Nash..............1891

Meridian.

Moore, Joshua Forrest.............1891

Port Gibson.

Shreve, John Alexander 1880

Scranton.

Cox, William Augustus 1894

MISSOURI.

Aux Vasse.

Craighead, Gordon Garriet.........1895

Boonville.

Mittelbach, William...............1891
Wooldridge, Daniel Turley.........1890

Carrollton.

PETIT, HENRY MCEWEN...............1860

Freeman.

Dolan, Frank Linley...............1888

Jefferson City.

Brandenberger, Adolph.............1894

Kansas City.

Breunert, Herman Otto.............1895
Crampton, Ferd Leslie 1896
Doerschuk, Albert Nathan 1895
Eyssell, George...................1889
Hess, Paul Ludwig.................1892
Krueger, Owen William 1897
Lahme, Charles Adolph 1881
Walker, David 1894

Kirkwood.

Geiger, Charles Frederick............1894
Hemm, Louis Phillips..............1894

Lebanon.

Farrar, Samuel Richard 1891

Louisiana.

Sombart, John Edward 1881

Marcelin, Linn Co.

Shelton, William Armstrong 1891

Mexico, Audrain Co.

LLEWELLYN, JOHN FREDERICK 1867

Newhall.

Darrah, Andrew Jackson 1895

Old Orchard, St. Louis Co.

Mueller, Ambrose..................1894

Pierce City, Lawrence Co.

Armstrong, George Revington 1877

Rich Hill.

Youngs, William 1883

St. Joseph.

Clark, James Ryland 1895
Demond, Otto John................1892

St. Louis.

Alexander, Maurice William 1871
Blank, Alois 1881
Boehm, Solomon 1871
Braun, Adolf Phillips Carl 1894
Good, James Michener 1871
Grandjean, Eugene 1871
Hassebrock, Henry Fred. 1884
Hemm, Francis.....................1881
Hinrichs, Gustavus Detlef 1895
Kaenter, Frederick William 1897
Klie, George Henry Charles 1878
Layton, Thomas 1892
Leitch, Arthur 1860
Mallinckrodt, Edward..............1869
MEYER, CHRISTIAN FRIED. GOTTLIEB.1860
Morley, William Jarman............1876
Pauley, Frank Charles.... 1879
SANDER, ENNO.....................1858
Scheffer, Henry William........... 1863
Schurk, Louis 1890
Sennewald, Ferdinand William 1865
Stark, Harry Hinkle 1893
Tomfohrde, Charles William 1890
Uhlich, Ferdinand Gottlieb..........1881
Vitt, Rudolph Simon 1895
Vordick, August Henry 1874
Walerius, Mathias 1897
Wall, Otto Augustus 1884
Westmann, Frank Henry 1882
Whelpley, Henry Milton............1887
Whitcomb, Frederick Ezekiel 1888
Wilson, Charles Frederick 1891
Wurmb, Theodore Henry...........1890
Young, Hiram W. 1894

St. Mary.

Lawbaugh, Emanuel Sylvester.......1895

West Plains.

Curry, Alfred Mustoon 1897

MONTANA.

Helena.

Starz, Emil Alfred 1895

NEBRASKA.

Fairbury.

Pease, Autumn Vine 1893

Fort Niobrara.

Denning, Michael 1897

Fremont.

Brunner, Charles Henry 1895

Grand Island, Hall Co.

Buchheit, Augustus William.........1893

Omaha.

Kuhn, Norman Archibald...........1878
Mares, Ferdinand Louis 1897
Myers, Preston B...................1897
Schmidt, Joseph H.................1897
Sherman, Charles Rollin............1889

NEVADA.

Carson City.

Steinmetz, Frank Jacob 1895

Reno.

Hodgkinson, Samuel Jackson........1895
Pinniger, William..................1895

Virginia City.

Cole, Allen M......................1895
Perkins, William Alexander 1869

Winnemucca.

Brown, William Ambrose 1893

NEW HAMPSHIRE.

Derry Depot.

Bell, Samuel Howard 1890

Dover.

TUFTS, CHARLES AUGUSTUS 1856

Exeter.

Wetherell, Albert Sumner 1892

Groveton.

Wilson, John March 1897

Hanover.

Downing, Lucien Bliss 1892

Lebanon.

Wilder, George Patterson 1892

Littleton.

Kenney, Herbert Eastman 1890
Robins, Wilbur Fiske 1892

Manchester.

Baril, Joseph Benjamin 1892
Miville, Francis Charles 1877

Nashua.

Whitman, Nelson Samuel 1875

New Market.

Dearborn, George Luther 1853

Portsmouth.

Grace, William Day 1896
Green, Benjamin 1888
Preston, Andrew Peabody 1881

Somersworth.

Hurd, John Charles 1892
MOORE, GEORGE 1859

NEW JERSEY.

Asbury Park.

Woolley, Stephen Disbrow 1888

Atlantic City.

Townsend, James Vaughan 1896
Wescott, William Carter 1896

Beverly.

Dougherty, Samuel Edward 1875

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton 1880

Bridgeton.

Dare, Charles Ford 1889
Davis, Theodore Garrison 1890

Camden.

Beringer, George Mahlon 1893

East Orange.

Cameron, Donald Lochiel 1897
Davis, William Mortimer 1879
Williams, Seward Whiting 1887

Elizabeth.

Frohwein, Richard 1867
Kent, Henry Avery, Jr. 1880
Oliver, William Murray 1875

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, John Putnam 1881

Hoboken.

KLUSSMANN, HERMANN 1876

Jersey City.

Abernethy, Maxwell 1865
Beardmore, William Arthur 1890
Foulke, James 1881
Gallagher, John Charles 1893
Hartnett, Eugene 1893
Lohmann, Herman Joseph 1896
Lyons, Fred. Wyckoff 1893
Vockroth, Emil 1893
White, George Henderson 1868
Wienges, Conrad 1875

Keyport.

Warn, William Edgar 1886

Lakewood, Ocean Co.

Harrison, William John 1896

Madison.

Brown, William Thompson 1894

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Morristown.

Carrell, Eugene Ayers 1875

Mt. Holly.

Jones, Edward Burrough............1894
WHITE, AARON SMITH..............1860

Newark.

Betzler, Jacob....................1880
HOLZHAUER, CHARLES 1873
Joyce, Robert.....................1895
Mennen, Gerhard..................1888
Sayre, William Henry..............1877
Smith, Charles Bradley.............1868
Smith, Clarence Pennington.........1890
Staebler, Richard Elimar Johannes...1892
Stamford, William Harrison.........1876
Van Winkle, Abraham..............1871

New Brunswick.

Kilmer, Frederick Barnett.........1886

Paterson.

Leonhard, Rudolph Ernest...........1891

Perth Amboy.

Parisen, George Warren.............1892

Plainfield.

Olliff, James Henry...............1867
Reynolds, Howard Prescott.........1875
Shaw, Robert Johnson..............1875

Princeton.

Priest, Carlton Rodgers.............1896

Riverside.

Pine, Warren Carleton..............1897

Somerville.

Cook, Gilbert Snowden.............1886

South Amboy.

JACQUES, GEORGE WASHINGTON......1869
Parisen, Allen Conrey..............1895

NEW MEXICO.

Hillsborough.

Nowers, Lawrence Edward.........1892

Silver City.

Porterfield, William Clement........1895

NEW YORK.

Albany.

Bradley, Frank Henry..............1896
Bradley, Theodore James...........1896
Gaus, Charles Henry...............1879
Huested, Alfred Birch..............1879
Lewi, Theodor Jay..................1896
Michaelis, Gustavus................1882
Richardson, Frank..................1896
Turner, George Heather............1880
Walker, William John..............1880

Binghamton.

Otis, Clark Zelotes.................1886

Brooklyn.

Bartley, Elias Hudson..............1893
Brooks, George Washington.........1879
Brundage, Albert Harrison..........1892
Colen, James Austin................1892
Cutts, Foxwell Curtiss, Jr............1875
DeForest, William Pendleton........1879
Dennin, Charles....................1875
Dennin, Edwin Clinton.............1892
Dewender, William Henry..........1896
Douglass, Henry....................1875
Dunn, John Augustus...............1867
Eccles, Robert Gibson..............1885
FOUGERA, EDMUND CHARLES HENRY 1890
Haviland, Henry.................1857
Henry, Hubert....................1897
Klock, George Hiram..............1897
Krieger, Philip....................1876
Levy, Adolph.....................1877
McElhenie, Thomas Diamond.......1872
McMahon, Joseph.................1897
Newman, George Anthony..........1865
OWENS, RICHARD JOHN............1860
Ray, Peter William................1892
Schimpf, Henry William............1894
Snyder, Ambrose Chancellor........1867
Squibb, Edward Hamilton..........1882
SQUIBB, EDWARD ROBINSON.........1858
Werner, Rudolph Carl..............1892
Zellhoefer, George.................1876

Buffalo.

Gregory, Willis George............1886
Hayes, Horace Phillips............1880
Lockie, James Alexander...........1896
Peabody, William Huntington......1857
Rano, Charles Orlando............1866

Catskill.

Du Bois, William Laneman.........1880

Corning.

Cole, Victor Le Roy...............1890

Croton-on-Hudson.

Henry, Charles (Dworniczak) 1881

Dannemora.

Mason, Harry Beckwith 1896

Dunkirk.

Davis, Eugene Miller 1892

Elmira.

Holmes, Clay Wood 1873

Fillmore, Alleghany Co.

Ridgway, Lemuel Augustus 1882

Fishkill-on-Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873
James, William Tefft 1882

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Gloversville, Fulton Co.

Miller, Jason Albert 1879
Van Auken, Jerrie A 1880

Groton.

Rhodes, Charles Orman 1895

Jamaica, Queens Co.

Baylis, Lewis Fosdick 1880
Goodale, Harvey Galusha. 1879
Peck, George Lyman 1883

Jamestown.

Winnberg, John Magnus 1892

Middletown.

KING, JAMES THEODORE 1859
Rogers, William Henry 1869

Mount Vernon.

Blackmore, Henry Spencer 1896
Gill, George 1872

Newburgh.

Chapman, Isaac Close 1887

Newport.

Parks, William Nathaniel 1897

New Rochelle.

Thomason, Richard John 1897

New York City.

Allison, William Outis 1895
Alpers, William Charles 1890
Amend, Bernard Gottwald 1892
Amend, Otto Paul 1892
Balser, Gustavus 1875
Billings, Henry Merry 1869
Boeddiker, Otto 1895
Chandler, Charles Frederic 1867
Coblentz, Virgil 1882
Cook, Thomas Penrose 1877
Elliott, Arthur Henry 1892
Ewing, John 1893
Fairchild, Benjamin Thomas 1875
Fairchild, Samuel William 1887
Fink, Frederick William 1886
Fraser, Horatio Nelson 1888
Freid, Isadore 1897
Gane, Eustace Harold 1895
Gardner, Robert Winslow 1867
Geisler, Joseph Frank 1889
Hauenstein, William 1883
Haynes, David Oliphant 1887
Heydenreich, Emile 1867
Hudnut, Alexander 1857
Jelliffe, Smith Ely 1895
Jewell, Walter Hart 1895
Jungmann, Julius 1879
Kalish, Julius 1875
Keenan, Thomas John 1894
Kemp, Edward 1888
Kennedy, Ezra Joseph 1887
Kneuper, George 1897
Kneuper, George Martin 1897
Lampa, Robert Raymond 1892
Lehn, Louis 1874
Louis, Leopold George 1897
Lovis, Henry Christian 1892
Main, Thomas Francis 1872
Massey, William Morton 1885
Mayo, Caswell Armstrong 1893
McIntyre, Byron Floyd 1876
McIntyre, Ewen 1873
McKesson, George Clinton 1888
McKesson, John, Jr. 1867
MILHAU, EDWARD LEON 1858
Molwitz, Ernest 1867
Murray, Benjamin Lindley 1896
Myers, William Henry 1897
O'Neil, Henry Maurice 1879
Osmun, Charles Alvin 1868
Peters, John Miller 1896

Plaut, Albert.......................1894
Pleasants, Charles Henry...........1890
Plummer, Edward..................1889
Quackinbush, Benjamin Franklin....1886
RAMSPERGER, GUSTAVUS............1860
Reynolds, Charles Edward..........1897
Rice, Charles.....................1870
Runyon, Edward Wheelock.........1875
Rusby, Henry Hurd...............1890
Sayre, Edward Augustus............1877
Schieffelin, William Jay............1892
Schmid, Henry....................1887
Schmidt, Ferdinand Traugott........1886
SEABURY, GEORGE JOHN............1876
Sellers, Walter Spangler............1897
Sieker, Ferdinand August...........1893
Skelly, James Joseph...............1866
Smith, Benjamin Franklin..........1892
Smith, Reuben Randolph...........1890
Stewart, Francis Edward............1884
Tsheppe, Adolph...................1876
Wichelns, Frederick................1881
Wickham, William Hull............1870
Wilson, William...................1876

Oswego.

Butler, Charles Henry..............1887

Ovid.

Rich, Willis Simmons..............1882

Plattsburgh.

Hitchcock, John E.................1892

Port Henry.

Smith, Edward Salvister............1890

Potsdam.

Thatcher, Hervey Dexter...........1865

Richfield Springs.

Smith, Willard Alfred..............1880

Rochester.

Schmitt, Joseph Max...............1882

Rome.

Owens, James Alanson.............1882

Saratoga Springs.

Fish, Charles Frederick............1866
Pennington, Thomas Henry Sands...1877

Syracuse.

Burdick, Frederick Richard.........1897
Dawson, Edward Seymour, Jr........1876
Snow, Charles Wesley.............1876
Webber, Joseph Le Roy............1886

Utica.

Blaikie, William...................1879
Cone, John Wright................1876
Maine, August....................1892

Wellsville, Alleghany Co.

Hall, Edwin Bradford..............1879

Yonkers.

Eschman, Frederick William Rudolph. 1880
Petsche, Franz Fred. Bismark Wilhelm. 1892

NORTH CAROLINA.

Asheville.

Smith, Whitefoord Gamewell........1892

Burlington.

Bradley, Augustus.................1894

Charlotte.

Wearn, William Henry..............1888

Concord.

Johnson, Daniel Dudley............1894

Durham, Orange Co.

Vaughan, Parry Wyche.............1882
Yearby, William Morgan...........1894

Franklin, Macon Co.

Smith, Frank Taylor...............1894

Maxton.

Croom, James Dallas...............1890

Oxford.

Hancock, Franklin Willis.......... 1888

Raleigh.

Bobbitt, James Henry..............1894
McRae, John Young...............1894
Simpson, William..................1873

Tarboro.

Zoeller, Edward Victor............1878

Wilmington.

Hardin, John Haywood............1881

NORTH DAKOTA.

Cavalier.

Ulm, Albert Gustave...............1897

Fargo.

Christianson, Lars 1896
Day, George Alvah 1896

Grafton.

Haussamen, Henry Louis 1888

Jamestown.

White, Herbert Eugene 1897

Lakota.

St. John, Sydney Sylvester 1897

Lisbon.

Parker, William Stillman 1895

Valley City.

Lee, Charles John 1896
Sullivan, John Wilber 1897

OHIO.

Brooklyn Village.

Schmidt, Carl 1891

Caldwell.

Bowron, Walter Henry 1890

Cambridge.

Ogier, John Morrison 1895

Chillicothe.

Howson, Arthur Bayshawe 1886
Nipgen, John Alvin 1879

Cincinnati.

Betz, Otto Edward 1887
De Lang, Alfred 1887
Eger, George 1864
Fennel, Charles Theodore Piderit 1886
Fieber, Gustavus Adolphus 1893
Freericks, Frank Herman 1897
Gordon, William John Maclester 1854
Greve, Theodore Lund August 1864
Greyer, Julius 1880
Heinemann, Otto 1864
Hoffman, Julius 1887
Klayer, Louis 1884
Koehnken, Herman Henry 1875
Lloyd, John Uri 1870
Meininger, Albert 1881
Merrell, Charles George 1888
Merrell, George 1879
Phillips, Charles Wilson 1881
Ruppert, John 1880
Sauer, Louis Wendlin 1882
Schroeder, John Henry 1896
Serodino, Herman 1880
Simonson, William 1887
Vilter, Hermann Theodore 1881
Wagner, Henry 1876
Weeks, Benjamin Franklin 1891
Wetterstroem, Albert Frederick Charles. 1888
Wetterstroem, Theodore David 1897
YORKSTON, MATTHEW MACKAY 1864
Zuenkeler, John Ferdinand 1887

Cleveland.

Acker, Philip 1889
Arny, Harry Vin 1891
Asplin, John Harding 1882
Bechberger, Henry 1893
Benfield, Charles William 1893
Bruce, James 1882
Cobb, Ralph Lathrop 1883
Feil, Joseph 1885
Gegelein, Frederick Leonhardt 1881
Gleim, John Christopher 1893
Haake, William Henry 1893
Hannan, Owen Burdette 1893
Hechler, George Louis 1882
Hopp, Lewis Christopher 1876
Kieffer, George 1890
Kuder, William Frank 1893
Lane, Edward Baxter 1893
Lehr, Philip 1885
Myers, Daniel 1882
Richardson, Samuel William 1897
Rosewater, Nathan 1880
Schellentrager, Ernst August 1882
Schoenhut, Christian Henry 1888
Selzer, Eugene Reinhold 1893
Sherwood, Henry Jackson 1894
Sords, Thomas Vincent 1893
Stecher, Henry William 1895
Urban, Jacob Philip 1881
Voss, George William 1885

Columbiana.

Ink, Charles Elliott 1885

Columbus.

Bruck, Philip Henry 1884
Byrne, John 1894
Hatton, Edgar Melville 1878
Hatton, Ellmore Wright 1894
Huston, Charles 1872
Karb, George James 1883
Kauffman, George Beecher 1882

Rauschkolb John..................1894
Schuelle., Ernst....................1881
Schueller, Frederick William 1880

Columbus Barracks.

Griffith, Thomas 1897

Conneaut, Ashtabula Co.

Symonds, Arthur Henry 1892

Dayton.

Burkhardt, Mark Anthony 1887
Kurfurst, Henry Ferdinand.... 1881

Delaware.

Pfiffner, Fritz John R. 1894

Findlay.

Firmin, John Curtis 1893

Glendale, Hamilton Co.

Feemster, Joseph Hall...............1873

Grand Rapids, Wood Co.

Thurston, Azor 1886

Jefferson, Ashtabula Co.

Case, Charles Henry.................1892

Lancaster.

Adamick, Gustave Hattenhauer......1891

Logan.

Harrington, Frank 1869

Massillon, Stark Co.

Baltzley, Zachariah Taylor 1876
Kirchhofer, Peter Paul...............1881

Middletown.

Johnson, Charles Brayton 1876

Navarre.

GROSSKLAUS, JOHN FERDINAND......1859

Norwood, Hamilton Co.

Weyer, John......................1887

Salem, Columbiana Co.

Hawkins, Michael Smith............1870

Scio.

Beal, James Hartley................1892

Springfield.

Casper, Thomas Jefferson 1867
Lisle, Justin Dickson 1894
Siegenthaler, Harvey N 1882

Wooster.

Ohliger, Lewis Philip 1871

OREGON.

Ashland.

Sherwin, Eugene Alonzo............1889

Portland.

Blumauer, Louis....................1889
Pfunder, William...................1889

The Dalles.

Blakeley, George Clarence 1892

Woods, Tillamook Co.

Linton, Charles Elsworth 1896

PENNSYLVANIA.

Allegheny City.

Eggers, Frederick Hermann 1872

Beaver, Beaver Co.

Andriessen, Hugo 1875

Carlisle.

Horn, Wilbur Fisk .... .1876

Chambersburg.

Crawford, Walter Beatty, Jr. 1891
Keefer, Charles DeWalt 1891

Coatesville.

Kenworthy, John...................1895

Connelisville.

Berryhill, Henry Pennick 1890

Harrisburg.

George, Charles Theodore 1873
Gorgas, George Albert..............1884
Gross, Edward Ziegler..............1883
Miller, Jacob Augustus.............1873

Haverford.

Harbaugh, Wilson Linn............1896

Honesdale.

Leine, Arthur Moritz...............1895

Lancaster.

HEINITSH, CHARLES AUGUSTUS 1857
Heinitsh, Sigmund William 1889

League Island.

Walts, David Yarnall...............1897

Lebanon.

LEMBERGER, JOSEPH LYON..........1858
Redsecker, Jacob Henry............1881

Lock Haven.

Prieson, Adolph...................1880

Mercer.

Graham, Frank Reed..... 1897

Norristown.

Reed, Willoughby Henry...........1893
Stabler, William....................1880

North Wales.

Childs, William Rhoads.............1896

Orwigsburg, Schuylkill Co.

Binkley, George K..................1892

Philadelphia.

BAUER, LOUIS GUSTAVUS 1867
Bohn, Charles Henry 1897
Borell, Henry Augustus 1874
BORING, EDWIN MCCURDY..........1867
Bullock, Charles...................1857
Burg, John Dellinger................1888
Cuthbert, Richard William..........1893
Danner, William Edward...........1896
Dobbins, Edwards Tompkins........1867
Eddy, Henry Clay 1869
Ellis, Evan Tyson 1857
England, Joseph Winters 1893
Fox, Peter Paul.....................1869
French, Harry Banks 1890
Gano, William Hubbell.............1892
Gerhard, Samuel 1873
Grahamc, Israel Janney 1856
Guise, P. Nettleton 1897
HANCE, EDWARD HANCE 1857
Hassinger, Samuel Ellphat Reed.....1880
Haussmann, Frederick William......1895
Heintzelman, Joseph Augustus 1858
Hoch, Aquila 1896
Holland, George 1894
Hunter, Henry Blount..............1894
Jenks, William Jenks 1858
Jones, Alexander Henry............1874
Kebler, Lyman Frederic............1894
Keeney, Caleb Reynolds............1868
Kline, Mahlon Norwood............1878
Koch, Louis 1872
Kraemer, Henry....................1892
Krewson, William Egbert...........1875
LaWall, Charles Herbert 1896
Lowe, Clement Belton...............1895
Matusow, Harry....................1897
McIntyre, William 1868
Mellor, Alfred 1864
MILLER, ADOLPH WILLIAM 1868
Milligan, Decatur...................1867
MOORE, JOACHIM BONAPARTE 1860
Morison, John Louis Dales 1895
Morris, Lemuel Iorwerth 1880
Mulford, Henry Kendall............1896
Newbold, Thomas Mitchell..........1876
Ottinger, James Jeremiah 1876
Peacock, Josiah Comegys 1892
Perot, Thomas Morris 1857
Pile, Gustavus 1881
Potts, David Gardiner 1893
Preston, David 1868
Procter, Wallace 1874
REMINGTON, JOSEPH PRICE 1867
Richter, Gustave Adolph............1890
Rittenhouse, Henry Norman........1857
ROSENGARTEN, MITCHELL GEORGE ...1869
Ryan, Frank Gibbs 1892
Sadtler, Samuel Philip..............1893
Shafer, Erwin Clement 1893
Shimer, Miles Herman 1897
SHINN, JAMES THORNTON 1860
Shoemaker, Richard Martin 1869
Stedem, Frederick Will. Edward 1892
Taylor, Alfred Bower..............1852
Thompson, William Beatty.........1858
Trimble, Henry 1876
Warner, William Richard.........1857
Webb, William Henry 1867
Weidemann, Charles Alexander......1868
Wendell, Henry Edward 1873
Wiegand, Thomas Snowdon 1857

Pittsburgh.

Emanuel, Louis 1878
Finley, Arthur Ardon Chapman......1890
Hays, Joseph Anthony 1892
Henderson, Archibald Keys.........1888
Holland, Samuel Smith.............1876
Kelly, George Armstrong 1882
Koch, Julius Arnold 1892
Nisbet, William Washington 1883

Pottsville.

Diebert, Thomas Irvin..............1882
Kennedy, George Washington 1869

Reading.

Weida, Charles Arthur 1896
Ziegler, Philip Milton 1867

Shamokin.

Smink, Robert William 1893
Smink, William Henry R. 1885

Towanda.

Porter, Henry Carroll 1880

Warren.

Dixson, Frederick Hartly 1892

West Chester.

Evans, Joseph Spragg............... 1877

White Haven.

Driggs, Charles M. 1881

Williamsport.

Cornell, Edward Augustus 1873
Duble, Jesse Balderston 1870

York.

Patton, John Franklin............... 1880

RHODE ISLAND.

Narragansett Pier.

Tobin, John Martin.................. 1887

Newport.

Baker, Maury Davison 1897
Cotton, William Henry.............. 1885
Downing, Benjamin Franklin, Jr. 1886
Huntington, William Hunter......... 1891
Roberts, William 1897
Wood, John William 1897

Providence.

Blanding, William Oliver 1894
CALDER, ALBERT LAYTON 1859
Cates, William Everett 1888
Danforth, Edmund Culver 1878
Fenner, Alexander Wilson, Jr. 1888
Gilbert, Charles Atwood............. 1891
Greene, William Ray 1883
Hardy, Cyrus Daniel................ 1891
O'Hare, James 1888
Pearce, Howard Anthony......... .. 1894
Potter, William Robert.............. 1894
Reynolds, William Keys............. 1876
Wood, Mason Bowen 1882

Westerly.

Collins, Albert Burlingame........... 1882

Woonsocket.

Simmons, Frank Birtles.............. 1897

SOUTH CAROLINA.

Anderson.

Wilhite, Frank Turner............... 1893

Charleston.

Aimar, Charles Pons 1879
Plenge, Henry Charles 1894

Columbia.

Thomas, Oscar Ernest............... 1882

Florence.

Brown, Robert Abner 1896

Newberry.

Robertson, Peter 1896

SOUTH DAKOTA.

Dell Rapids.

Bent, Edward Clarence.............. 1897

Lake Preston, Kingsbury Co.

Keith, Irwin Alonzo 1892

Sioux Falls.

Ayer, Charles Foster 1891
Dunning, Lyman Tylor.............. 1897

Tyndall.

Cotton, Robert M................... 1893

Watertown.

Jones, David Franklin............... 1895

Yankton.

Brecht, Frederick Adolph............ 1895
Tammen, George................... 1895

TENNESSEE.

Chattanooga.

Greve, Charles Mathias........... .. 1887
Voigt, Joseph Frederick 1893

Clarksville.

Lockert, Charles Lacy............... 1894

Columbia.

Rains, Aris Brown.................. 1894

Harriman.

Kline, Charles Grant............... 1894

Knoxville.

Gooding, Charles John 1892
Rosenthal, David Abraham..........1894

Memphis.

Peck, Frank Hugh..................1897
ROBINSON, JAMES SCOTT............1869
Treherne, John Curtis 1894

Murfreesboro.

Vickers, Rufus William.............1894

Nashville.

Blackman, William Marshall 1896
Bloomstein, Max 1896
Burge, James Oscar................1878
Davis, Edward Benjamin............1896
Ruddiman, Edsel Alexander.........1894
Thomas, James....................1896

TEXAS.

Dallas.

De Lorenzi, Albert 1890
Eberle, Eugene Gustavus 1896
Keene, Thomas Rucker 1888
Schweickhardt, Richard 1890

El Paso.

Irvin, William Armstrong...........1879

Galveston.

Orton, Ingomar Francois............1891

Granbury, Hood Co.

Morgan, Eugene Hilliard...........1892

Houston.

Burgheim, Jacob 1892

Paris.

Greiner, William Edward...........1892

Rockwall.

Vance, James Walter...............1895

San Antonio.

Schmitt, George Joseph Francis......1890

Taylor.

Thames, Joseph Jefferson 1895

Tyler.

Gee, Charlie 1893

Van Alstyne.

Neathery, James Miller.............1892

UTAH.

Salt Lake City.

Brother, William 1892
Druehl, Frank August..............1889
Hill, Frederick John 1895

VERMONT.

Fort Ethan Allen.

Cabell, Henry Otto 1897

Rutland.

Higgins, Albert Warren 1895

St. Albans.

Dutcher, Alfred Luther.............1892

St. Johnsbury.

Bingham, Charles Calvin............1875

VIRGINIA.

Charlottesville.

Wills, Frederick Miles..............1890

Danville.

Cole, Howson White................1882

Falls Church.

Church, Merton Elbridge 1892

Fredericksburg.

Hall, Horace Byrd..................1896

Leesburg.

Purcell, Nicholas Sidney............1890

Norfolk.

Hargrave, Edward Thomas..........1897

Richmond.

Baker, Thomas Roberts 1873
Briggs, Andrew Gessner 1890
Harrison, Richard Heth Munford....1895
Miller, Polk.......................1894
Miller, Turner Ashby...............1894
Scott, William Henry...............1873
Slaughter, Philip Mercer............1897

WASHINGTON.

La Connor, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus. 1889

Pullman.

Watt, George Henry 1896

Seattle.

Holmes, Henry Elliott..............1880

Snohomish.

Wilbur, Lot 1896

Tacoma.

Cummings, Henry Thornton 1853
Stewart, Andrew Morley 1896

Walla Walla.

Mason, George L. 1895

WEST VIRGINIA.

Wheeling.

Williams, William Hudson 1880

WISCONSIN.

La Crosse.

Beyschlag, Charles 1880

Madison.

Kremers, Edward 1887

Mayville, Dodge Co.

Sauerhering, Rudolph Aurelius 1884

Medford.

Hammel, Joseph 1897

Milwaukee.

Conrath, Adam 1881
Dadd, Robert Morrow 1896
DRAKE, JOHN RANSOM 1860
Kettler, Edward, Jr 1896
Kienth, Hans 1884
Ruenzel, Henry Gottlieb 1892
Schrank, Charles Henry 1876

Neillsville.

Sniteman, Charles Clarence 1881

Westby.

Noer, Olaf 1897

WYOMING.

Rawlins.

Stuver, Emanuel 1895

Rock Springs.

Daus, Leopold Louis 1895

DOMINION OF CANADA.

MANITOBA.

Winnepeg.

Flexon, Charles 1897

NEW BRUNSWICK.

St. John.

Coupe, Robert Edward 1894

NOVA SCOTIA.

Halifax.

Simson, Francis Cook 1876
Simson, William Amore 1894

ONTARIO.

Hamilton.

Clark, John Alexander 1890

Ottawa.

SAUNDERS, WILLIAM 1860
Watters, Henry 1896

St. Thomas.

Foster, William Orrville 1881

Stratford.

WAUGH, GEORGE JAMES 1862

Toronto.

Flett, Frederick William 1895
Heebner, Charles Frederick 1894
Holgate, Francis Heasell 1895
Lander, John Cambridge 1877
Lowden, John 1875
Robinson, Ernest Frankish 1889

Windsor.

D'Avignon, John Eugene 1888

PRINCE EDWARD ISLAND.

Charlottetown.

Dodd, Simon Walker 1884

QUEBEC.

Lachine.

Ranson, Edward A. 1897

Montreal.

Baridon, Louis Richard 1890
Chapman, William Henry 1895
Décary, Louis Arthur 1895
Gray, Henry Robert 1867
Howey, John Joseph 1896
Lachance, Seraphin 1888

Lanctot, Henri Raymond 1894
Lecours, Joseph Edourd Wilfrid 1896
Macmillan, Alexander Morrison 1896
Miles, Henry 1896
Morrison, Joseph Edward 1888
Muir, Ebenezer 1895
Reed, Thomas Dennis 1896
Tremble, John Edward 1896

Quebec.

Dubé, J. Edmond 1897
Power, John J. 1897
Roy, Joseph Auguste Emile 1896
Willis, Henry 1897

Three Rivers.

Williams, Richard Wellington 1883

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Bowen, William Africanus, Delagoa Bay, Portuguese East Africa 1897
Egeling, Berthold Frederick Gustavus, Chihuahua, Mexico 1893
Hammar, Alrik, Yokohama, Japan 1897
Heyl, James Bell, Hamilton, Bermuda 1863
Hoffmann, Frederick, Leipzig, Germany 1867
Martin, Nicholas Henry, Newcastle upon Tyne, England 1891
Power, Frederick Belding, London, England 1872
Rumsey, Samuel Louis, Honolulu, Hawaiian Islands 1876
St. Cyr, Etienne Laurent Nelvil, Aux Cayes, Hayti, W. I. 1897
WELLCOME, HENRY SOLOMON, London, England 1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Cornell, Russell Wilbur 1893
Kaiser, William O 1893
Leitch, Arthur 1860
McConville, Thomas Aloysius 1864
McPherson, George 1865
Wardell, Robert C 1860
Westlake, Leonard John 1895
Woods, George Dana 1895

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, 17 Bloomsbury Square, London, W. C., England.
Carteighe, Michael, F. I. C., 180 New Bond Street, London, W., England.
De Vrij, Dr. J. E., 54 Heerengracht, The Hague, Netherland.
Dragendorff, Dr. G., Rostock, Germany.
Gille, Norbert, Professor in the École Vétérinaire de l'État, Bruxelles, Belgium.
Greenish, Thomas, F. C., 20 New Street, Dorset Square, London, N. W., England.
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296 N. Market st., Chicago, Ill.
Flemer, Lewis,
1418 14th st., N. W., Washington, D. C.
Fletcher, John W.,
Main st., Batesville, Ark.
Flett, Frederick W.,
502 W. Queen st., Toronto, Can.
Flexon, Charles,
Clarendon Hotel, Winnipeg, Can.
Flint, George B.,
1171 Broadway, Oakland, Cal.
Ford, Charles M.,
700 15th st., Denver, Col.
Fortier, Lawrence H.,
372 High st., Holyoke, Mass.
Foster, J. Webb,
637 Hanover st., Baltimore, Md.
Foster, William O.,
221 Talbot st., St. Thomas, Ontario, Can.
FOUGERA, EDMOND C. H.,
309 8th st., Brooklyn, N. Y.
Foulke, James,
107 Monticello ave., Jersey City Heights, N. J.
Fox, Peter P.,
Woodland ave. & 73d st., Philadelphia, Pa.
Frames, J. Fuller,
601 N. Gay st., Baltimore, Md.
Frazer, Horatio N.,
262 5th ave., New York, N. Y.
Frauer, Herman E.,
246 E. Washington st., Indianapolis, Ind.
Freeman, William B.,
127 Gordon st., West End, Atlanta, Ga.
Freericks, Frank H.,
Grand & Nassau sts., Cincinnati, O.
Freid, Isadore,
333 Willis ave., New York, N. Y.
French, Harry B.,
429 Arch st., Philadelphia, Pa.
French, John I.,
2 A, Park st., Boston, Mass.
Frerksen, Richard C.,
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Frohwein, Richard,
121 1st st., Elizabethport, N. J.
Frost, William A.,
Selby & Western aves., St. Paul, Minn.
Frye, George C.,
320 Congress st., Portland, Me.
FULLER, OLIVER F.,
220 Randolph st., Chicago, Ill.
Furl, Irwin W.,
821 Jefferson st., Phoenix, Ariz.

Gale, Edwin O.,
85 S. Clark st., Chicago, Ill.
Gale, William H.,
82 S. Clark st., Chicago, Ill.
Gallagher, John C.,
466 Grove st., Jersey City, N. J.
Galt, Edward P.,
924 Broad st., Selma, Ala.
Gamble, Stewart,
301 Hennepin ave., Minneapolis, Minn.
Gammon, Irving P.,
150 Dudley st., Boston, Mass.
Gane, Eustace H.,
91 Fulton st., New York, N. Y.
Gano, William H.,
1634 Columbia ave., Philadelphia, Pa.
Gardner, Robert W.,
158 William st., New York, N. Y.
Gaus, Charles H.,
202 Washington ave., Albany, N. Y.
Gausewitz, Wm.,
Bridge st., Owatonna, Minn.
Gayle, John W.,
Ann & Market sts., Frankfort, Ky.
Gayner, John N.,
Grove City, Minn.
Gee, Charlie,
116 W. Erwin st., Tyler, Tex.
Gegelein, Frederick L.,
Lexington & Russell aves., Cleveland, O.
Geiger, Charles F.,
Kirkwood, Mo.
Geisler, Joseph F.,
6 Harrison st., New York, N. Y.
George, Charles T.,
1306 N. 3d st., Harrisburg, Pa.
Gerhard, Samuel,
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Gessner, Emil A.,
301 Chapel st., New Haven, Conn.
Getty, Wilmot S.,
348 Robert st., St. Paul, Minn.
Gilbert, Charles A.,
1 Whittemore Pl., Providence, R. I.
Gill, George,
164 S. 4th ave., Mount Vernon, N. Y.
Gilpin, Henry B.,
Light & Lombard sts., Baltimore, Md.
Girling, Robert N.,
Holmesville, Miss.
Gleim, John C.,
301 Superior st., Cleveland, O.
Glover, William H.,
591 Essex st., Lawrence, Mass.
Godbold, Fabius C.,
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Goodwin, William W.,
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Gray, William,
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Green, Benjamin,
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6th & Market sts., Chattanooga, Tenn.
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Greyer, Julius,
Vine & Findlay sts., Cincinnati, O.
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Hall, Nettie C.,
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Hall, William A.,
Cass & Lafayette sts., Greenville, Mich.
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Harrison, Richard H. M.,
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Harrison, Wm. J.,
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Hartnett, Eugene,
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Hartwig, Otto J.,
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Heyl, James B.,
Vice-Consul, Hamilton, Bermuda.
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Warren, Huntington co., Ind.
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Hoch, Aquila,
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Hoffman, Julius,
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Hoffmann, Frederick,
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Smithfield & Liberty sts., Pittsburgh, Pa.
Holmes, Clay W.,
410 W. Gray st., Elmira, N. Y.
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Holverson, Henry T.,
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Hopp, Lewis C.,
198 Euclid ave., Cleveland, O.
Horn, Wilbur F.,
32 West Main st., Carlisle, Pa.
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Howard, Fletcher,
Des Moines, Ia.
Howey, John J.,
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Hudson, T. F.,
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Huecker, John,
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77 Eagle st., Albany, N. Y.
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208 Western ave., Minneapolis, Minn.
Huhn, George,
Care Ger. Amer. Bank, Minneapolis, Minn.
Humiston, Edwin Ray, Jr.,
Worthington, Minn.
Hunter, Henry B.,
145 N. 10th st., Philadelphia, Pa.
Huntington, William H.,
U. S. Naval Sta., Newport, R. I.
Hurd, John C.,
26 Market st., Somersworth, N. H.
Hurlebaus, George W.,
2030 14th st. N. W., Washington, D. C.
Hurty, John N.,
104 N. Penn st., Indianapolis, Ind.
Huston, Charles,
47 S. High st., Columbus, O.
Hutton, Harry D.,
1033 22d st. N. W., Washington, D. C.
Hydren, Carl,
223 North st., Pittsfield, Mass.
Hynson, Henry P.,
423 N. Charles st., Baltimore, Md.
Ingalls, John,
4th & Poplar sts., Macon, Ga.
Ink, Charles E.
Columbiana, O.
Irvin, William A.,
El Paso, Texas.
Jacobs, Joseph,
53 Marietta st., Atlanta, Ga.
JACQUES, GEORGE W.,
Broadway & Augusta st., S. Amboy, N. J.
James, William T.,
20 Main st., Flushing, N. Y.
Jelliffe, Smith E.,
231 W. 71st st., New York, N. Y.
Jenks, William J.,
4043 Market st., Philadelphia, Pa.
Jesson, Jacob,
Euclid ave., Ontario, Cal.
Jewell, Walter H.,
98 William st., New York, N. Y.
Joergensen, Sophus,
Commercial st., La Conner, Skagit co., Wash.
Joerger, Frederick,
Brunswick, Glynn co., Ga.
Johnson, Charles B.,
54 Third st., Middletown, O.
Johnson, Daniel D.,
Concord, N. C.
Johnson, Knute A.,
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Johnston, Henry A.,
1221 New Jersey ave. N.W., Washington, D.C.
Jones, Alexander H.,
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Jones, David F.,
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Jones, Edward B.,
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Jones, James T.,
855 E. 4th st., South Boston, Mass.
Jones, Simon N.,
1st & Jefferson sts., Louisville, Ky.
Joy, Edwin W.,
Market & Powell sts., San Francisco, Cal.
Joyce, Robert,
67 Bank st., Newark, N. J.
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812 Main st., Little Rock, Ark.
Jungmann, Julius,
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Kauffman, George B.,
235 N. High st., Columbus, O.
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Keenan, Thomas J.,
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Keith, Irwin A.,
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Kelley, Charles M.,
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392 Boylston st., Boston, Mass.
Kelly, George A.,
101 Wood st., Pittsburg, Pa.
Kemp, Edward,
68 William st., New York, N. Y.
Kennedy, Ezra J.,
106 Fulton st., New York, N. Y.
Kennedy, George W.,
103 N. Centre st., Pottsville, Pa.
Kenney, Herbert E.,
Littleton, N. H.
Kent, Henry A., Jr.,
Park Drug Store, Elizabeth, N. J.
Kent, Robert R.,
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Kenworthy, John,
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Lisle, Justin D.,
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Puckner, William A.,
73 Wells st., Chicago, Ill.
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Shumpik, Edward,
1921 N. Washington ave.,Minneapolis,Minn.
Shurtleff, Israel H.,
39 Elm st., New Bedford, Mass.
Siegemund, Charles A.,
84 Crawford st., Roxbury, Mass.
Siegenthaler, Harvey N.,
22 E. High st., Springfield, O.
Sieker, Ferdinand A.,
128 William st., New York, N. Y.
Simmons, Frank B.,
182 Main st., Woonsocket, R. I.
SIMMS, GILES G. C.,
1344 New York ave., Washington, D. C.
Simon, William,
1348 Block st., Baltimore, Md.
Simonson, William,
9th & Race sts., Cincinnati, O.
Simpson, William,
101 Fayetteville st., Raleigh, N. C.
Simpson, William C.,
Vienna, Ill.
Simson, Francis C.,
Pentagon Bdg., Halifax, N. S.
Simson, William A.,
Care Simson Bros. & Co., Halifax, N. S.
Skelly, James J.,
339 E. 14th st., New York, N. Y.
Skinner, William H.,
Pocahontas, Ark.
Slack, Henry R., Jr.,
East side Public Square, La Grange, Ga.
Slater, Frank H.,
P. O. Box 10, Matawan, Monmouth co., N. J.
Slaughter, Philip M.,
725 N. 28th st., Richmond, Va.
SLOAN, GEORGE W.,
22 W. Washington st., Indianapolis, Ind.
Smink, Robert W.,
309 W. Spruce st., Shamokin, Pa.
Smink, William H. R.,
33 Market st., Shamokin, Pa.
Smith, B. Frank,
252 E. 60th st., New York, N. Y.
Smith, Charles B.,
861 Broad st., Newark, N. J.
Smith, Clarence P.,
861 Broad st., Newark, N. J.
Smith, Edward N.,
93 Main st., Thompsonville, Conn.
Smith, Edward S.,
Main st., Port Henry, N. Y.
Smith, Frank T.,
Franklin, Macon co., N. C.
Smith, James P.,
1776 Broad st., Augusta, Ga.
Smith, Lauriston S.,
King st., St. Augustine, Fla.
Smith, Linton,
Church & Bennett sts., Wilmington, Del.
Smith, Linville H.,
701 Centre st., Jamaica Plain, Mass.
Smith, Reuben R.,
198 9th ave., New York, N. Y.
Smith, Samuel W.,
182 Main st., Ansonia, New Haven co., Conn.
Smith, Theodric,
1343 Pennsylvania ave., Baltimore, Md.
Smith, Thomas E.,
252 Beauregard st., Mobile, Ala.
Smith, Whitefoord G.,
31 Patton ave., Asheville, N. C.
Smith, Willard A.,
Main st., Richfield Springs, N. Y.
Smithson, David E.,
Emmett, Canyon co., Idaho.

Sniteman, Charles C.,
Neillsville, Clark co., Wis.
Snow, Charles W.,
214 Warren st., Syracuse, N. Y.
Snyder, Alva L.,
33 Court Sq., Bryan, O.
Snyder, Ambrose C.,
13½ St. Felix st., Brooklyn, N. Y.
Snyder, Robert J.,
2d & Market sts., Louisville, Ky.
Sohrbeck, G. Henry,
3d ave. and 16th st., Moline, Ill.
Sohrbeck, George W.,
1601 3d ave., Moline, Ill.
Solomons, Isaiah A.,
163 Congress st., Savannah, Ga.
Sombart, John E.,
Louisiana, Mo.
Sords, Thomas V.,
315 Pearl st., Cleveland, O.
Spalding, Warren A.,
89 Church st., New Haven, Conn.
Sparks, James M.,
718 Garrison ave., Fort Smith, Ark.
Spaulding, George S.,
Alexandria, Douglas co., Minn.
Sperry, Herman J.,
633 Chapel st., New Haven, Conn.
Sprague, Wesson G.,
Main st., Flushing, Mich.
Squibb, Edward H.,
36 Doughty st., Brooklyn, N. Y.
SQUIBB, EDWARD R.,
36 Doughty st., Brooklyn, N. Y.
St. Cyr, Nelvil,
Aux Cayes, Hayti, W. I.
St. John, Sydney S.,
Lakota, N. Dak.
STACEY, BENJAMIN F.,
Thompson Square, Charlestown, Mass.
Staebler, Richard,
848 Broad st., Newark, N. J.
Stahler, William,
Main & Swede sts., Norristown, Pa.
Stahlhuth, Ernst H. W.,
5th & Washington sts., Columbus, Ind.
Stam, Colin F.,
Chestertown, Kent co., Md.
Stamford, William H.,
256 Mulberry st., Newark, N. J.
Stamm, Dante M.,
Geneseo, Ill.
Stange, Carl F.,
U. S. R. S. Independence, Mare Island, Cal.
Stark, Harry H.,
2108 Lucas Pl., St. Louis, Mo.
Starz, Emil A.,
204 Rodney st., Helena, Mont.
Staudt, Louis C.,
15 S. Broadway, Aurora, Ill.
Stearns, Frederick,
371 Lafayette ave., Detroit, Mich.
Stearns, Henry A.,
Care of Fred. Stearns & Co., Detroit, Mich.
Stecher, Henry W.,
1066 Pearl st., Cleveland, O.
Stedem, Frederick W. E.,
Broad st. & Fairmount av., Philadelphia, Pa.
Steele, George R.,
Main & Prospect sts., Thompsonville, Conn.
STEELE, JAMES G.,
635 Market st., San Francisco, Cal.
Steinhauer, Frederick,
1553 Larimer st., Denver, Colo.
Steinmetz, Frank J.,
Opp. Post Office, Carson City, Nev.
Stevens, Alonzo B.,
13 Oakland ave., Ann Arbor, Mich.
Stewart, Andrew M.,
910 Pacific ave., Tacoma, Wash.
Stewart, Francis E.,
Merck Bldg.,UniversityPlace,NewYork,N.Y.
Stiles, Justin E.,
Wells, Minn.
Stoehr, Julius J.,
King st., Garrett, Ind.
Stoughton, Dwight G.,
204 State st., Hartford, Conn.
Stowell, Daniel,
1045 Washington st., Boston, Mass.
Stratte, Halvor A.,
Dawson, Minn.
Stuver, Emanuel,
Rawlins, Wyo.
Sullivan, John W.,
Valley City, N. Dak.
Sweeney, Robert O.,
Duluth, St. Louis co., Minn.
Sweet, Caldwell,
22 W. Market Square, Bangor, Me.
Symonds, Arthur H.,
Conneaut, Ashtabula co., O.
Tammen, Geo.,
110 W. 3d st., Yankton, S. Dak.

Taylor, Alfred B.,
2338 N. 6th st., Philadelphia, Pa.
Taylor, George E.,
615 Harrison ave., Leadville, Colo.
Taylor, Walter T.,
709 Dauphine st., New Orleans, La.
Temple, Oscar F.,
U. S. A., Fort Riley, Kan.
Thames, Joseph J.,
E. Main st., Taylor, Williamson co., Tex.
Thatcher, Hervey D.,
12 Market Square, Potsdam, N. Y.
Thieman, John H., Jr.,
1600 W. Broadway, Louisville, Ky.
Thomas, James,
428 Union st., Nashville, Tenn.
Thomas, Oscar E.,
164 Main st., Columbia, S. C.
Thomas, Robert, Jr.,
126 Broadway, Thomasville, Ga.
Thomason, Richard J.,
100 Union ave., New Rochelle, N. Y.
Thomasson, Anders,
277 Central st., Lowell, Mass.
Thompson, Albert D.,
101 S. Washington ave., Minneapolis, Minn.
Thompson, John,
U.S.M.Corps, 8th st. S. E., Washington, D. C.
Thompson, William B.,
4804 Trinity Place, W. Philadelphia, Pa.
Thompson, William S.,
703 15th st., Washington, D. C.
Thomsen, John J.,
16 W. German st., Baltimore, Md.
Thorn, Henry P.,
Main st., Medford, N. J.
Thurston, Azor,
Grand Rapids, Wood co., O.
Tigner, James O.,
Greenville, Meriwether co., Ga.
Tilden, Amos K.,
31 School st., Boston, Mass.
Tobin, John M.,
Narragansett Pier, R. I.
Todd, Albert M.,
204 N. Rose st., Kalamazoo, Mich.
Tomfohrde, Charles W.,
1827 Cass Ave., St. Louis, Mo.
Tomlinson, Burton A.,
Care of McPike & Fox, Atchison, Kan.
Topley, James,
166 Georgia st., Vallejo, Solano co., Cal.
Torbert, Willard H.,
756 Main st., Dubuque, Ia.
Townsend, James V.,
13 S. Penna. ave., Atlantic City, N. J.
Tracy, David W.,
139 Main st., Hartford, Conn.
Trautmann, Ludwig,
Wabasha, Minn.
Treat, Joseph A.,
Stuart, Guthrie co., Ia.
Treherne, John C.,
189 Hernando st., Memphis, Tenn.
Tremble, John E.,
2480 St. Catharine St., Montreal, Can.
Trevitt, Cleophas A.,
331 Broad st., Rome, Ga.
Trimble, Henry,
145 N. 10th st., Philadelphia, Pa.
Troxler, Constantine, Jr.,
228 W. Breckenridge st., Louisville, Ky.
Truax, Charles,
81 Randolph st., Chicago, Ill.
Tsheppe, Adolph,
64th st. & Park ave., New York, N. Y.
Tucker, Greenleaf R.,
City Hospital, Boston, Mass.
TUFTS, CHARLES A.,
85 Washington st., Dover, N. H.
Tuma, Bruno,
11 Camp st., New Orleans, La.
Turner, George H.,
296 S. Pearl st., Albany, N. Y.
Turrell, Judson W.,
Longmont, Colo.
Uhlich, Ferdinand G.,
2001 Salisbury st., St. Louis, Mo.
Ulm, Albert G.,
Cavalier, N. Dak.
Urban, Jacob P.,
60 Ontario st., Cleveland, O.
Valliant, George E.,
720 Main st., Pine Bluff, Ark.
Van Antwerp, Andrew,
Dauphin & Royal sts., Mobile, Ala.
Van Antwerp, Garet,
71 Dauphin st., Mobile, Ala.
Van Auken, Jerrie A.,
17 N. Main st., Gloversville, N. Y.
Van Winkle, Abraham W.,
35 Clinton ave., Newark, N. J.
Vance, James W.,
S. E. cor. Square, Rockwall, Tex.

Vargas-Heredia, Jorge,
474 Columbus ave., Boston, Mass.
Varney, Edward F.,
39 Tremont st., Boston, Mass.
Vaughan, Parry W.,
Main st., Durham, Orange Co., N. C.
Vellines, Davies,
700 N. Fulton ave., Baltimore, Md.
Vernor, James,
33 Woodward ave., Detroit, Mich.
Viallon, Paul L.,
Park & Front sts., Bayou Goula, La.
Vickers, Rufus W..
Murfreesboro, Tenn.
Vilter, Hermann T.,
76 McMicken ave., Cincinnati, O.
Vitt, Rudolph S.,
3860 S. Broadway, St. Louis, Mo.
Vockroth, Emil,
79 Newark ave., Jersey City, N. J.
Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.
Vonachen, Frank H.,
622 N. Adams st., Peoria, Ill.
Vordick, August H.,
Jefferson ave. & Benton st., St. Louis, Mo.
Voss, George W.,
680 Woodland ave., Cleveland, O.
Votteler, William,
Shelby & Oak sts., Louisville, Ky.
Wagner, Henry,
9th & Linn sts, Cincinnati, O.
Walbrach, Arthur,
1414 15th st., Denver, Colo.
Walerius, Mathias,
U. S. M. Hospital, St. Louis, Mo.
Walker, David,
601 S. W. Boulevard, Kansas City, Mo.
Walker, John P.,
Main st., Freehold, N. J.
Walker, William J.,
74 State st., Albany, N. Y.
Wall, Otto A.,
4500 S. Compton ave., St. Louis, Mo.
Walts, David Y., [Island, Pa.
U. S. R. S. Richmond, Navy Yard, League
Wangler, Conrad D.,
227 E. 4th st., Waterloo, Ia.
Wanous, Josie,
521 Nicollet ave., Minneapolis, Minn.
Ward, A. Jae,
8 S. Tejon st., Colorado Springs, Colo.

Ward, Charles A.,
P. O. Box 460, Stoneham, Mass.
Ward, Charles E.,
790 Broadway, Denver, Colo.
Ward, George J.,
Front st., St. Clair City, Mich.
Ward, Milo W.,
212 2d st., Des Moines, Ia.
Wardell, Robert C.,
Residence Unknown.
Warn, William E.,
1st st., Keyport, N. J.
Warner, William R.,
1228 Market st., Philadelphia, Pa.
Warren, Edwin A.,
400 Sibley st., St. Paul, Minn.
Warren, William M.,
154 Lafayette ave., Detroit, Mich.
Washburn, Harry M.,
823 Kansas ave., Topeka, Kan.
Watson, Herbert K.,
803 Market st., Wilmington, Del.
Watson, Sidney P.,
137 Richardson st., Atlanta, Ga.
Watt, George H.,
Pullman, Wash.
Watters, Henry,
Sparks & Bank sts., Ottawa, Can.
WAUGH, GEORGE J.,
Ontario st., Stratford, Ont., Can.
Wearn, William H.,
Trade & Tryon sts, Charlotte, N. C.
Webb, David C.,
Forrest City, Ark.
Webb, William H.,
556 N. 16th st., Philadelphia, Pa.
Webber, J. Le Roy,
Care Clinton Pharm. Co., Syracuse, N. Y.
Webster, H. Gordon,
15 Washington ave. W., Minneapolis, Minn.
Weeks, B. Frank,
1126 Dayton st., Cincinnati, O.
Weida, Charles A.,
224 N. 5th st., Reading, Pa.
Weidemann, Charles A.,
2148 Green st., Philadelphia, Pa.
Weihe, Otto A.,
640 Post st., San Francisco, Cal.
Weiser, William A.,
Lock Box 169, Bourbon, Ind.
WELLCOME, HENRY S.,
8 Snow Hill, London, England.

Wells, Charles H.,
601 Main st., Pueblo, Colo.
Wells, Edwin H.,
43 Hanover st., Boston, Mass.
Wendell, Henry E.,
3d & George sts., Philadelphia, Pa.
Wenzell, William T.,
113 Fulton st., San Francisco, Cal.
Werner, Rudolf C.,
2592 Atlantic ave., Brooklyn, N. Y.
Wescott, William C.,
Pacific and Delaware aves., Atlantic City, N.J.
West, Charles A.,
99 Broad st., Boston, Mass.
Westcott, James W.,
423 N. Charles st., Baltimore, Md.
Westlake, Leonard J.,
Residence unknown.
Westmann, Frank H.,
2744 Cass ave., St. Louis, Mo.
Wetherell, Albert S.,
122 Water st., Exeter, N. H.
Wetterstroem, Albert,
435 Colerain ave., Cincinnati, O.
Wetterstroem, Theodore D.,
3929 Spring Grove ave., Cincinnati, O.
Weyer, John,
Norwood, Hamilton co., O.
Wheeler, William D.,
21 Massachusetts ave., Boston, Mass.
Whelpley, Henry M.,
2342 Albion Place, St. Louis, Mo.
Whitcomb, Frederick E.,
Broadway & Olive st., St. Louis, Mo.
WHITE, AARON S.,
59 High st., Mt. Holly, N. J.
White, George H.,
Newark & Jersey aves., Jersey City, N. J.
White, Herbert E.,
Jamestown, N. Dak.
White, Richard E.,
400 Hayes st., San Francisco, Cal.
WHITFIELD, THOMAS,
240 Wabash ave., Chicago, Ill.
Whiting, J. Fred.,
Main st., Great Barrington, Mass.
Whitman, Nelson S.,
175 Main st., Nashua, N. H.
Whitney, Edgar F.,
Warren, Minn.
WHITNEY, HENRY M.,
297 Essex st., Lawrence, Mass.
Wichelns, Frederick,
192 Greenwich st., New York, N. Y.
Wickham, William H.,
91 Fulton st., New York, N. Y.
Wiegand, Thomas S.,
145 N. 10th st., Philadelphia, Pa.
Wienges, Conrad,
473 Jersey ave., Jersey City, N. J.
Wilbur, Lot,
Ave. C & 1st st., Snohomish, Wash.
Wilder, George P.,
N. Park st., Lebanon, N. H.
Wilhite, Frank T.,
39 Public Square, Anderson, S. C.
Williams, Charles F.,
Main st., Thomaston, Conn.
Williams, George G.,
P. O. Box 3551, Boston, Mass.
Williams, John K.,
391 Main st., Hartford, Conn.
Williams, Richard W.,
Notre Dame st., Three Rivers, Quebec, Can.
Williams, Seward W.,
8 Brighton ave., East Orange, N. J.
Williams, William H.,
659 Main st., Wheeling, W. Va.
Willis, Henry,
4 St. John st., Quebec, Can.
Wills, Fred. M.,
323 Main st., Charlottesville, Va.
WILSON, BENJAMIN O.,
28 Merchants' Row, Boston, Mass.
Wilson, Charles F.,
11th & Auburn sts., St. Louis, Mo.
Wilson, Frank M.,
133 Main st., Willimantic, Conn.
Wilson, John E.,
Front st., Walnut Ridge, Lawrence co., Ark.
Wilson, John M.,
Groveton, N. H.
Wilson, William,
86 Broadway, New York, N. Y.
Wingate, Frank H.,
Sanford, York co., Me.
WINKELMANN, JOHN H.,
31 Hopkins Place, Baltimore, Md.
Winnberg, John M.,
200 Main st., Jamestown, N. Y.
WINTER, JONAS,
202 Prospect st., Hagerstown, Md.
Wittich. Matthew H.,
2451 Bloomington ave., Minneapolis, Minn.

Wittmer, Joseph W., Jr.,
527 Clay st., Dubuque, Ia.
WOLTERSDORF, LOUIS,
171 Blue Island ave., Chicago, Ill.
Wood, Alonzo F., Jr.,
2 Church st., New Haven, Conn.
Wood, Edward S.,
688 Boylston st., Boston, Mass.
Wood, James P.,
2 Church st., New Haven, Conn.
Wood, John W.,
Naval Hospital, Newport, R. I.
Wood, Mason B.,
P. O. Box 58, East Providence, R. I.
Woodman, Walter I.,
St. Augustine, Fla.
Woodruff, Roderick S.,
92 Prospect st., Waterbury, Conn.
Woods, Chas. H. A.,
U. S. Marines, Louisville, Ky.
Woods, George D.,
Residence Unknown.
Woodward, Brinton W.,
Lawrence, Kan.
Wooldridge, Daniel T.,
9 Morgan st., Boonville, Mo.
Woolley, Stephen D.,
Asbury Park, N. J.
Wooten, Thomas V.,
943 W. Madison st., Chicago, Ill.
Wulling, Frederick J.,
Minn. University, Minneapolis, Minn.
Wunderlich, Edward,
1415 Dryades st., New Orleans, La.
Wurmb, Theodore H.,
1923 E. Grand ave., St. Louis, Mo.
Wyckoff, Elmer E.,
2409 7th ave., Rock Island, Ill.
Yearby, William M.,
123 E. Main st., Durham, N. C.
YORSTON, MATTHEW M.,
429 Central ave., Cincinnati, O.
Young, Hiram W.,
2001 N. Broadway, St. Louis, Mo.
Youngs, William,
114 Park ave., Rich Hill, Mo.
Zahn, Emil A.,
1801 State st., Chicago, Ill.
Zellhoefer, George,
1044 Broadway, Brooklyn, N. Y.
Ziegler, Philip M.,
526 Penn st., Reading, Pa.
Zimmer, Harry E.,
78 E. Washington st., Indianapolis, Ind.
Zimmermann, Albert,
2113 S. Adams st., Peoria, Ill.
Zimmermann, Bernard,
45 E. 4th st., St. Paul, Minn.
Zimmermann, Charles,
105 2d ave., Peoria, Ill.
Zoeller, Edward V.,
Main st., Tarboro, N. C.
Zuenkeler, J. Ferd.,
686 Vine st., Cincinnati, O.
Zwick, George A.,
11th st. & Madison ave., Covington, Ky.

LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF LAST REPORT.

	Elected.
Bechmann, Chas. R	1882
Bishop, Francis M	1882
Blair, Henry C	1868
Boggs, Edwin L	1872
Boyce, Samuel R	1894
Brace, Wm. D	1895
Brown, Henry J	1882
Bruguier, Francis	1876
Burnham, Edward S	1874
Burns, J. Kellar	1876
Colgan, John	1867
Copeland, Sydney F	1892
Corcoran, Charles E	1895
Culver, Anson A	1890
Davis, George R	1883
Dedrick, Wm. F	1884
Delouest, Edw	1890
Ditman, Andrew J	1868
Donaldson, Pierre	1891
Dreher, Louis A	1881

	Elected.
Drury, John S.	1889
Edwards, Nathan W.	1879
Elbe, Constantine B.	1877
Fischer, E. Baldwin	1895
Franklin, Philip H.	1881
Geier, Oscar W.	1880
Goodwin, Lester H.	1875
Grandjean, Charles	1871
Green, Hamer H.	1892
Harvey, John M.	1890
Hilby, Francis M.	1886
Hildreth, Newton G.	1879
Hogan, Louis C.	1890
Hyler, Wm. H.	1875
Ingalls, Albert O.	1885
Jamieson, Thomas N.	1888
Keppler, Charles L.	1891
Krehe, J. Theodor	1884
Livingston, Barent V. B.	1872
Macdonald, Daniel T.	1884
Marelius, Charles R.	1896
Marsteller, George L.	1883
May, Arthur F.	1881
McGill, John T.	1895
Meyer, Wm. V.	1893
Mowry, A. D.	1884
Parker, George H.	1874
Parker, Walter W.	1894
Prall, Delbert E.	1876
Pyle, Cyrus	1859
Rademaker, H. H.	1879
Riesenman, Joseph	1883
Roberts, Daniel J.	1881
Scoville, Charles H.	1882
Sedberry, Bond E.	188[illegible]
Shake, Homer C.	1862
Slocum, Frank L.	1880
Smith, Joseph S.	1878
Tobey, Charles W.	1879
Weinman, Oscar C.	1873
Werner, Benj. C.	1895
Whall, Joseph S.	1873
Williams, Duane B.	1881

LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF LAST REPORT.

Anderson, Chas. B.,	Rockport, Ind.,	Elected 1891
Atwood, Hermon W.,	New York, N. Y.,	" 1873
Bastin, Edson S.,	Philadelphia, Pa.,	" 1895
Bendiner, Samuel J.,	New York, N. Y.,	" 1882
Biddle, Herbert G.,	Lane, O.,	" 1888
Brown, Robert J.,	Leavenworth, Kan.,	" 1862
Coon, J. V. D.,	Olean, N. Y.,	" 1880
GRIFFITH, ALBERT R.,	New York, N. Y.,	" 1870
Hager, H. H. J. (Honorary),	Frankfurt, Germany,	" 1868
Hattenhauer, Robert C.,	La Salle, Ill.,	" 1881
Kelley, Gilliam J.,	Atlanta, Ga.,	" 1894
Kurfurst, Henry F.,	Dayton, O.,	" 1881
McAfee, John J.,	Mobile, Ala.,	" 1890
McElwee, Emer J.,	Mt. Pleasant, Pa.,	" 1888
McLean, George,	Orrick, Mo.,	" 1894
Paine, James D.,	Rochester, N. Y.,	" 1857
Parr, John C.,	Los Angeles, Cal.,	" 1856
Rudolf, Mrs. Eliza,	New Orleans, La.,	" 1887
Sherwood, Lewis W.,	Columbus, O.,	" 1882
Turner, Thos. L.,	North Weymouth, Mass.,	" 1853
Wehrly, Thomas M.,	Washington, D. C.,	" 1883
White, William H.,	Meridian, Miss.,	" 1891
Wilcox, Frederick,	Waterbury, Conn.,	" 1878

LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF DUES, ACCORDING TO ART. III., CHAPTER VII., OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE ADOPTED AT MONTREAL, CANADA, AUGUST, 1896. SEE PAGE 17, VOLUME 44, PROCEEDINGS.)

	Elected.
Albright, Emmet C.	1894
Apel, Frederick E.	1892
Aubley, Samuel	1888
Auf'mwasser, Hugo W.	1892
Auf'mwasser, Julius H.	1893
Bartlett, John A.	1893
Bauer, David S.	1894
Bernhard, Charles H.	1888
Bird, Harry L.	1891
Boisvert, Pierre	1891
Bondurant, Charles S.	1888
Boyden, Henry D.	1893
Bradley, Charles L.	1894
Breningstall, Reuben G.	1891
Breslin, Michael T.	1891
Bridges, Charles H.	1892
Brooks, Frederic P.	1891
Brundage, Fred.	1888
Bunting, Lindsay	1890
Carr, Will L.	1894
Christian, John F.	1894
Coblentz, Joe. Dan.	1894
Cohn, Richard	1892
Cole, Charles M.	1888
Commings, Charles S.	1888
Cone, Alfred G.	1892
Conger, Iliff	1891
Constantine, Edward R.	1891
Cox, John T.	1892
Cunningham, Mrs. Henrietta M.	1894
Cushman, Henry C.	1887
Dashiell, Robert M.	1894
Daubach, Charles J.	1889
Dell, William A.	1890
Deutsch, Julius W.	1888
Dietrich, H. Dickson	1889
Dunham, Henry B.	1892
Dupont, William	1887
Elliott, Sidney T.	1893
Fay, Hamilton	1889
Feldkamp, Chas. L.	1893
Fetzer, Nevin D.	1894
Field, James C.	1894
Fish, Frederic W.	1892

	Elected.
Fleischmann, Augustus T.	1885
Flint, John H.	1889
Flood, William H.	1892
Forsyth, William K.	1892
Franken, James L.	1892
Gibson, James E.	1887
Goodwill	1891
Graner, Albert	1891
Graner, William	1891
Grosvenor, Daniel P.	1881
Hale, Chester S.	1892
Hargrave, Benj. W.	1894
Harper, Harry W.	1881
Herbst, Frederick W	1882
Hille, David J.	1893
Houghton, Harry J	1891
Hunter, Buxton W	1891
Jacocks, John S.	1894
Jones, James H.	1892
Judisch, George	1890
Kilbourne, Lewis P.	1891
Klauber, Charles N.	1891
Kline, Charles S.	1891
Knudsen, Rudolph H.	1892
Koles, Samuel M.	1890
La Rue, William I.	1892
Lavigne, Jean B	1891
Leavitt, Miner L. H.	1890
Leenheer, Bastian	1891
Lehnkering, Charles F.	1893
Lillybeek, Oscar	1891
Maisch, Henry C. C.	1885
McFarland, Andrew	1891
Means, John C.	1891
Melvin, Samuel H.	1889
Moffett, Thomas J	1893
Mohr, Charles A.	1894
Moore, Thomas F.	1894
Morland, Robert L.	1892
Morse, C. Milan	1888
Murphy, John J.	1892
Myers, George W.	1894
Noble, William W	1893
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